Quantum

User's Guide User's Guide User's Guide User's Guide

Quantum Scalar i40 and Scalar i80

Scalar Libraries

6-66545-001 Rev B

Scalar i40 and Scalar i80 User's Guide, 6-66545-001 Rev B, November 2009, Product of USA.

Quantum Corporation provides this publication "as is" without warranty of any kind, either express or implied, including but not limited to the implied warranties of merchantability or fitness for a particular purpose. Quantum Corporation may revise this publication from time to time without notice.

COPYRIGHT STATEMENT

Copyright 2009 by Quantum Corporation. All rights reserved.

Your right to copy this manual is limited by copyright law. Making copies or adaptations without prior written authorization of Quantum Corporation is prohibited by law and constitutes a punishable violation of the law.

TRADEMARK STATEMENT

Quantum, the Quantum logo, and Scalar are registered trademarks of Quantum Corporation, registered in the U.S. and other countries.

Backup. Recovery. Archive. It's What We Do., StorageCare, and Vision are trademarks of Quantum.

LTO and Ultrium are trademarks of HP, IBM, and Quantum in the U.S. and other countries. All other trademarks are the property of their respective companies.

Specifications are subject to change without notice.

Contents

Preface xix

Chapter 1 Description 1

Overview . . . 1

Library Components . . . 2
- Front Panel . . . 2
- Robotic System and Barcode Scanner . . . 3
- Magazines . . . 4
- Power Supply . . . 7
- System Control Board . . . 7
- Tape Drives . . . 8

Standard Features . . . 10
- User Interface . . . 10
- Partitions . . . 10
- Control Path Modification . . . 10
- Support for WORM . . . 11

Licensable Features . . . 11
- Capacity on Demand (COD) . . . 11
- Advanced Reporting . . . 11

Chapter 2 Initial Installation and Setup 13

Required Tools and Equipment 13
Before You Begin 14
Unpacking the Library 14
Accessory Kit Items 18
Installing the Library in a Rack or Desktop Kit 18
Installing Tape Drives 18
Connecting the Cables 19
Turning the Library ON and Configuring Network Settings 19
Accessing the Library Via the Web Client 25
Configuring Partitions 26
Importing Tape Cartridges 26
Saving the Library Configuration 26
Configuring the Host Software 26

Chapter 3 Understanding the User Interface 27

Operator Panel 27
- Operator Panel Layout and Functions 28
- Navigating and Editing on the Operator Panel 30

Web Client 31
- Tips 31
- Sorting Information In Tables 32
- Web Client Layout and Functions 32
- Web Client Home Page 34
- System Summary 34
- Subsystem Status 35

Menu Trees 36

Chapter 4 Configuring the Library 39

Using the Setup Wizard . . . 41

Default Configuration . . . 42

Configuring Network Settings . . . 42
- Library Host Name . . . 43
- DHCP . . . 43
- IP Addresses . . . 44
- Default Gateway, Subnet Mask, Network Prefix, and DNS Addresses . . . 45

Configuring SNMP Settings . . . 45
- Registering External Management Applications . . . 46
- Enabling SNMP Versions . . . 47
- Enabling SNMP Authentication Traps . . . 47
- Modifying the SNMP Community String . . . 48
- Downloading the SNMP MIB . . . 48

Setting the Date, Time, and Time Zone . . . 49
- Setting the Date and Time Manually . . . 50
- Setting the Date and Time Using the Network Time Protocol . . . 50
- Setting the Time Zone . . . 51
- Setting Daylight Saving Time . . . 51

Working With Partitions . . . 52
- Automatically Creating Partitions . . . 53
- Manually Creating Partitions . . . 55
- Modifying Partitions . . . 57
- Deleting Partitions . . . 57
- Viewing the Current Partitions . . . 58
- Changing Access to Partitions . . . 59
- Taking a Partition Online or Offline . . . 59

Configuring Cleaning Slots . . . 61

Configuring I/E Station Slots . . . 63

Configuring Tape Drive Parameters . . . 65

Configuring Control Paths . . . 67

Adding or Upgrading Licensable Features . . . 68
- Viewing Your License Keys . . . 68
- Viewing Installed Licenses . . . 68
- About License Keys . . . 69

Obtaining a License Key 69
Applying a License Key 70

Working With E-mail Notifications 71
Creating E-mail Notifications 72
Modifying E-mail Notifications 73
Deleting E-mail Notifications 74

Configuring the Library E-Mail Account. 74

Setting Customer Contact Information 77

Configuring the Service Port 77

Working With Local User Accounts 78
Using the Web Client Default Administrative User Account . . 79
Privilege Levels 80
Creating Local User Accounts on the Web Client 81
Modifying Local User Accounts on the Web Client 82
Deleting Local User Accounts on the Web Client 82
Enabling and Creating Passwords on the Operator Panel 83
Disabling Passwords on the Operator Panel 85
Modifying Passwords on the Operator Panel 85
Resetting Passwords on the Operator Panel 86

Working With LDAP User Accounts (Remote Authentication) 86
Local Authentication vs. Remote Authentication 86
Using Microsoft Active Directory. 87
LDAP Server Guidelines 87
Enabling and Configuring LDAP on the Library. 88
Configuring Kerberos 90
Generating the Kerberos Service Keytab File 91

Setting the Session Timeout 93

Configuring System Settings 93
Unload Assist 94
Logical Serial Number Addressing. 94
Manual Cartridge Assignment 95
SNMP 96
SMI-S 96

Configuring Security Settings 97
Network Interface 97
SSH Services 97
Internet Control Message Protocol (ICMP) 98
Remote Access Via Web Client 98

Remote Service Login 99
SSL 99

Saving and Restoring the Library Configuration 100
Saving the Library Configuration 101
Restoring the Library Configuration 101

Registering the Library. 102

Chapter 5 Performing Library Operations 103

Logging In 104
Simultaneous Logins 104
Logging In for the First Time 104
Logging In Using the Operator Panel 104
Logging In Via the Web Client 105
Logging In When LDAP or Kerberos is Enabled 105

Logging Out 106

Shutting Down, Restarting, Turning Off, and Removing Power 107
Shutting Down the Library 107
Restarting the Library 109
Turning Off the Library 111
Completely Removing Library Power 111
Emergency Power-off Procedure 112
Taking the Library Offline 113

Unlocking the I/E Station 113

Releasing Magazines 114
Releasing Magazines via the User Interface 115
Releasing Magazines Manually 116

Performing Media Operations 117
Importing Tape Cartridges 117
Bulk Loading Tape Cartridges 121
Moving Tape Cartridge 121
Exporting Tape Cartridges 123
Loading Tape Drives 125
Unloading Tape Drives 127

Cleaning Tape Drives 128
Valid Cleaning Cartridges 130
About AutoClean 130
Enabling AutoClean 130

Importing Cleaning Cartridges 131
Exporting Cleaning Cartridges 133
Manually Cleaning Tape Drives 134

Taking a Tape Drive Online or Offline 137

Chapter 6 Getting Information About the Library 139

Viewing Library Information 140

Viewing System Information 140

Viewing the Library Configuration Report 141

Saving and E-mailing the Library Configuration Record 143
Saving the Configuration Record 144
E-mailing the Configuration Record 145

Viewing the Network Settings Report 145

Viewing the Logged in Users Report 146

Viewing the All Slots Report 147

Viewing, Saving, and E-mailing Logs 148
Cleaning Log 148
Diagnostic Tickets Log 149
Tape Drive Log 149

Viewing Library Information on the Operator Panel 151
Viewing Partition Information 151
Viewing Network Settings 151
Viewing the Date, Time, and Time Zone 152
Viewing Licenses 152

Using Advanced Reporting 152
Required Firmware 153
Using the Reports and Understanding the Data 153
Loading and Reloading Advanced Reporting Data 154
Configuring the Drive Resource Utilization Report 154
Configuring the Media Integrity Analysis Report 156
Saving and E-mailing Advanced Reporting Data 157
Creating and Using a Template 158
Deleting Advanced Reporting Data 158

Viewing the Open Source License Agreement 159

Viewing the Copyright Statement 160

Chapter 7 Updating Firmware 161

Upgrading Library Firmware 161

Updating and Autoleveling Tape Drive Firmware 164
About Tape Drive Firmware Autoleveling 164
Uploading Tape Drive Firmware Used in Autoleveling. 166
Deleting Tape Drive Firmware Used in Autoleveling 168
Initiating Tape Drive Firmware Autoleveling 169

Chapter 8 Installing, Removing, and Replacing Components 171

Taking ESD Precautions 172

Connecting Library Cables 173

Installing the Rack Mount Kit (Rail Kit) 174
Supported Rack Types. 175
Space Requirements 175
Tools Required 176
Rack Mount Kit Contents 176
Installing the Rack Mount Shelves. 177

Installing the Library In a Rack. 186

Removing the Library From a Rack 188

Installing the Library in a Desktop Kit 189
Kit Contents 191
Tools Required 191
Space Requirements 192
Procedure 192

Removing the Library from a Desktop Kit 197

Removing and Replacing the Front Bezel. 198
Required Tools 198
Bezel Replacement Kit Contents 198
Bezel Replacement Procedure 198

Removing and Replacing the Chassis. 202
Required Tools 203
Procedure 203

Removing and Installing a Filler Plate 213
Removing and Installing a Tape Drive Filler Plate 213
Removing and Installing a Power Supply Filler Plate 214

Removing and Replacing a Magazine 215
Required Tools 215
Magazine Replacement Kit Contents 215
Creating a Backup Map of Cartridge Locations 216
Removing the Magazine from the Library 216
Installing the Magazine 217

Removing and Installing a Power Supply 220
Replacing a Power Supply in a Single-Power-Supply System (Scalar i40 and Scalar i80) 221
Adding or Replacing a Redundant Power Supply on the Scalar i80 222

Removing and Replacing the System Control Board 223
Replacing the System Control Board 224
Installing Library Firmware 226
Restoring the Library Configuration 228
Manually Reconfiguring the Library 229

Removing and Replacing a Tape Drive 231
Preparing Partitions and Control Paths 231
Removing a Tape Drive from the Library 232
Installing a Tape Drive 233

Packaging the Library for Moving or Shipping 237
Packaging Kit Contents 237
Creating a Backup Map of Cartridge Locations 237
Procedure 237

Replacing the Robot 242

Chapter 9 Troubleshooting 243

About Diagnostic Tickets 244
Viewing, Closing, and Resolving Diagnostic Tickets 245

Capturing the Library Snapshot 247

Troubleshooting Library “Not Ready” Messages 248
“Not Ready” Messages on the Operator Panel 248
“Not Ready” Messages on the Web Client 248

Retrieving Tape Drive Logs 250

Interpreting LEDs 250
Front Panel LEDs 251
System Control Board LEDs 252

Tape Drive/Sled LEDs 253
Power Supply LED 255

Running the Installation and Verification Test (IVT) 255

Running the IVT Diagnostic Subtests Individually – Robotics, Tape Drive, and Magazine Tests 257

Running the Random Move Test 258

Performing Library Diagnostics 259
Resetting a Tape Drive 260
Robotics Get/Put Test 261

Resetting Factory Defaults 261

Chapter 10 Working With Cartridges and Barcodes 263

Handling Cartridges Properly 264

Write-Protecting Tape Cartridges 265

Barcode Requirements 265

Installing Barcode Labels 267

Appendix A Specifications 269

Physical Specifications 269

Capacity 270

Environmental Specifications 271

Air Clearance Requirements 271

Power Specifications 272

Communication Interfaces 272

Supported Tape Drives 273

Supported Media 273

Supported Internet Browsers 274

Appendix B Tape Alert Flag Descriptions 275

Appendix C **Disposal of Electrical and Electronic Equipment** **285**

Glossary **287**

Index **297**

Figures

Figure 1 Front Panel 2
Figure 2 Scalar i40 Internal Layout and Magazine Slot Location Coordinates 5
Figure 3 Scalar i80 Internal Layout and Magazine Slot Location Coordinates 6
Figure 4 Scalar i80 Back Panel Components 9
Figure 5 Scalar i80 Back Panel Components 9
Figure 6 Packaging 15
Figure 7 Pushing Down on Thumbscrews to Release Robot 16
Figure 8 Removing the Robot Restraint 17
Figure 9 Turning on the Library 20
Figure 10 Setup Wizard – Initial Screen 20
Figure 11 Setup Wizard – Date/Time Screen 21
Figure 12 Changing the Date and Time 22
Figure 13 Setup Wizard – Setup Network Screen 22
Figure 14 Setup Wizard – Licenses Screen 23
Figure 15 Setup Wizard – Current Configuration Screen 24
Figure 16 Setup Wizard Complete 25
Figure 17 Operator Panel User Interface - Home Page 28

Figure 18 Changing the Date and Time 31
Figure 19 Web Client User Interface - Home Page 33
Figure 20 Operator Panel Menus 37
Figure 21 Web Client Menus 38
Figure 22 Shutdown in Progress Message 108
Figure 23 Ready to Power Down Message 108
Figure 24 Ready to Power Down Message 109
Figure 25 Series of Restart Messages 110
Figure 26 Magazine Unlocked Message 114
Figure 27 Magazine Unlocked Message 115
Figure 28 Magazine Release Latch Access 117
Figure 29 Saving and E-mailing the Report Data 157
Figure 30 Template and Report Data Functions 159
Figure 31 Reinstalled Components 174
Figure 32 Rack Mount Shelf Depth Requirements 178
Figure 33 Assembling the Left and Right Rack Mount Shelves 179
Figure 34 Rail Adapter Types 180
Figure 35 Assembling the Left-Hand Rack Mount Shelf 181
Figure 36 Installing the Rack Mount Shelves 183
Figure 37 Tightening the Rack Mount Shelves 184
Figure 38 Location for Installing the Clip Nut or Cage Nut 186
Figure 39 Magazine Release Latch Access Holes 187
Figure 40 Securing the Scalar i40 and Scalar i80 in the Rack 188
Figure 41 Desktop Kit, Scalar i40 and Scalar i80 190
Figure 42 Magazine Release Latch Access Holes 193
Figure 43 Location of Rubber Feet on Bottom of Library 194
Figure 44 Installing the side panels 196
Figure 45 Installing the Top Cover 197
Figure 46 Bezel Screw Locations on Bottom of Library 200

Figure 47 Bezel Screws 201
Figure 48 Components to Remove 206
Figure 49 Removing the Robot Restraint 207
Figure 50 Restraining the Robot 209
Figure 51 Reinstalled Components 212
Figure 52 Filler Plates Installed 215
Figure 53 Magazine Release Latch Access Holes 217
Figure 54 Proper Orientation (Right-Side Magazine) 218
Figure 55 Removing/Installing the Magazine Bezel 219
Figure 56 Single Power Supply System 221
Figure 57 Redundant Power Supply System 221
Figure 58 Ethernet Port Locations on the SCB 226
Figure 59 Acceptable Installation Locations for Full-Height Tape Drives 234
Figure 60 Installing a Tape Drive 235
Figure 61 Restraining the Robot 240
Figure 62 Packing the Library for Shipping 241
Figure 63 Front Panel LEDs 251
Figure 64 System Control Board LEDs 252
Figure 65 Fibre Channel Tape Drive LEDs 254
Figure 66 Power Supply LED 255

Tables

Table 1 Front Panel Features 2
Table 2 Operator Panel Functions 28
Table 3 Web Client Screen Elements 34
Table 4 Fibre Channel Tape Drive Configurable Settings 65
Table 5 Base Library 269
Table 6 Library Installed in a Desktop Kit 270
Table 7 Tape Alert Flag Severity Codes 275
Table 8 Tape Alert Flag Descriptions 276

Preface

This manual introduces the Quantum Scalar® i40 and Scalar i80 and discusses:

- System operations
- Configuration
- Web and operator panel interface
- Installation and replacement
- Basic troubleshooting

Audience

This manual is written for Scalar i40 and Scalar i80 operators, system administrators, and field service engineers.

Document Organization

Following is a brief description of chapter contents.

- Chapter 1, Description provides a physical description of the library, its components, and major features.
- Chapter 2, Initial Installation and Setup explains how to install and configure your library.
- Chapter 3, Understanding the User Interface describes the appearance and function of the operator panel and Web client.

- Chapter 4, Configuring the Library provides instruction and description for all the configurable features of the library.
- Chapter 5, Performing Library Operations explains how to run the library from the operator panel and Web client.
- Chapter 6, Getting Information About the Library describes all of the reporting features on the library.
- Chapter 7, Updating Firmware describes how to upgrade library firmware and install and autolevel tape drive firmware.
- Chapter 8, Installing, Removing, and Replacing Components provides detailed instruction on how to install, remove, and replace all the physical components of the library.
- Chapter 9, Troubleshooting describes the library's troubleshooting tools, including diagnostic tickets, LEDs, and tests.
- Chapter 10, Working With Cartridges and Barcodes provides basic information about how to label and care for media used in the library.
- Appendix A, Specifications provides physical, environmental, power, and other specifications about the library, tape drives, and media.
- Appendix B, TapeAlert Flag Descriptions lists all the Tape Alerts you may encounter in a diagnostic ticket.
- Appendix C, Disposal of Electrical and Electronic Equipment provides information on disposing and recycling.

The document concludes with a glossary and index.

Notational Conventions

This manual uses the following conventions:

Convention	Example
File and directory names, menu commands, button names, and window names are shown in bold font.	**/data/upload**
Menu names separated by arrows indicate a sequence of menus to be navigated.	**Utilities > Firmware**

The following formats indicate important information:

Note: Note emphasizes important information related to the main topic.

Caution: Caution indicates potential hazards to equipment or data.

WARNING: Warning indicates potential hazards to personal safety.

- Right side of the system — Refers to the right side as you face the component being described.
- Left side of the system — Refers to the left side as you face the component being described.

Product Safety Statements

Quantum will not be held liable for damage arising from unauthorized use of the product. The user assumes all risk in this aspect.

This unit is engineered and manufactured to meet all safety and regulatory requirements. Be aware that improper use may result in bodily injury, damage to the equipment, or interference with other equipment.

The *System, Safety, and Regulatory Information Guide* is located on the Scalar i40 and Scalar i80 documentation and training CD.

WARNING: Before operating this product, read all instructions and warnings in this document and in the *System, Safety, and Regulatory Information Guide*.

警告 在使用本产品之前，请先阅读本文档及系统、安全和法规信息指南中所有的说明和警告信息。

警告 操作本產品前，請先閱讀本文件及系統、安全與法規資訊指南中的指示與警告說明。

ADVERSAL	Læs alle instruktioner og advarsler i dette dokument og i *Vejledning om system-sikkerheds- og lovgivningsoplysninger*, før produktet betjenes.
AVERTISSEMENT	Avant d'utiliser ce produit, lisez la totalité des instructions et avertissements de ce document et du *Guide d'informations sur le système, la sécurité et la réglementation*.
HINWIES	Lesen Sie vor der Verwendung dieses Produkts alle Anweisungen und Warnhinweise in diesem Dokument und im System, Safety, and Regulatory Information Guide (Info-Handbuch: System, Sicherheit und Richtlinien).
אזהרה	לפני ההפעלה של מוצר זה, קרא את כל ההוראות והאזהרות הכלולות במסמך זה וכן במדריך *מידע בנושאי מערכת, בטיחות ותקינה*
警告	この製品を使用する前に、本文書、および『システム、安全、規制に関する情報ガイド』に記載しているすべての警告と指示をお読みください。
경고	이 제품을 작동하기 전에 이 문서 및 시스템, 안전, 및 규제 정보 안내서에 수록된 모든 지침과 경고 표지를 숙지하십시오.
ПРЕДУПРЕЖДЕНИЕ	всеми инструкциями и предупреждениями, приведенными в данном документе и в *Справочном руководстве по устройству, технике безопасности и действующим нормативам*.
ADVERTENCIA	Antes de utilizar este producto, lea todas las instrucciones y advertencias en este documento y en la Guia informativa sobre sistema, seguridad y normas.
VARNING	Läs alla anvisningar och varningar i detta dokument och i *System, säkerhet och krav från myndigheter - Informationshandbok* innan denna produkt tas i bruk.

Related Documents

The following Quantum documents are also available for Scalar i40 and Scalar i80 systems:

Document No.	Document Title
6-66546-xxx	*Scalar i40 and Scalar i80 Quick Start Guide*
6-66547-xxx	*Scalar i40 and Scalar i80 Release Notes*
6-00618-xx	*System, Safety, and Regulatory Information*
6-66773-xx	*Scalar i40 and Scalar i80 Basic SNMP Reference Guide*
6-00423-xx	*Quantum Intelligent Libraries SCSI Reference Guide*
6-01317-xx	*Quantum Intelligent Libraries SMI-S Reference Guide*

For the most up to date product information and documentation, see:

http://www.quantum.com/ServiceandSupport/Index.aspx

SCSI-2 Specification

The SCSI-2 communications specification is the proposed American National Standard for information systems, dated March 9, 1990. Copies may be obtained from:

Global Engineering Documents
15 Inverness Way, East
Englewood, CO 80112
(800) 854-7179 or (303) 397-2740

Contacts

Quantum company contacts are listed below.

Quantum Corporate Headquarters

To order documentation on the Scalar i40 or Scalar i80 or other products, contact:

Quantum Corporation *(Corporate Headquarters)*
1650 Technology Drive, Suite 700
San Jose, CA 95110-1382

Technical Publications

To comment on existing documentation send e-mail to:

doc-comments@quantum.com

Quantum Home Page

Visit the Quantum home page at:

http://www.quantum.com

Getting More Information or Help

StorageCare™, Quantum's comprehensive service approach, leverages advanced data access and diagnostics technologies with cross-environment, multi-vendor expertise to resolve backup issues faster and at lower cost.

Accelerate service issue resolution with these exclusive Quantum StorageCare services:

Quantum. Global Services

- **Service and Support Web site** - Register products, license software, browse Quantum Learning courses, check backup software and operating system support, and locate manuals, FAQs, firmware downloads, product updates and more in one convenient location. Benefit today at:

  http://www.quantum.com/ServiceandSupport/Index.aspx

- **eSupport** - Submit online service requests, update contact information, add attachments, and receive status updates via e-mail. Online Service accounts are free from Quantum. That account can also be used to access Quantum's Knowledge Base, a

comprehensive repository of product support information. Sign up today at:

http://www.quantum.com/osr

- **StorageCare Guardian** - Securely links Quantum hardware and the diagnostic data from the surrounding storage ecosystem to Quantum's Global Services Team for faster, more precise root cause diagnosis. StorageCare Guardian is simple to set up through the internet and provides secure, two-way communications with Quantum's Secure Service Center. More StorageCare Guardian information can be found at:

  http://www.quantum.com/ServiceandSupport/Services/GuardianInformation/Index.aspx

For further assistance, or if training is desired, contact Quantum Customer Support Center:

United States	800-284-5101 (toll free) 949-725-2100
EMEA	00800-4-782-6886 (toll free) +49 6131 3241 1164
APAC	+800 7826 8887 (toll free) +603 7953 3010
For worldwide support: http://www.quantum.com/ServiceandSupport/Index.aspx	

Worldwide End-User Product Warranty

For more information on the Quantum Worldwide End-User Standard Limited Product Warranty:

http://www.quantum.com/pdf/QuantumWarranty.pdf

Chapter 1
Description

This chapter covers the layout and basic functionality of the library, including:

- Overview
- Library Components
- Standard Features
- Licensable Features

Overview

The Scalar i40 and i80 tape libraries automate the retrieval, storage, and management of tape cartridges. Tape cartridges are stored in the library and mounted and dismounted from tape drives using firmware running on the library or software running on the host systems.

See Appendix A, Specifications for library capacity and a list of tape drives and media supported by the Scalar i40 and Scalar i80 libraries.

Library Components

Front Panel

Figure 1 illustrates the features of the operator panel. The picture shows the Scalar i40, but the features are the same on the Scalar i80. These features are described in Table 1.

Figure 1 Front Panel

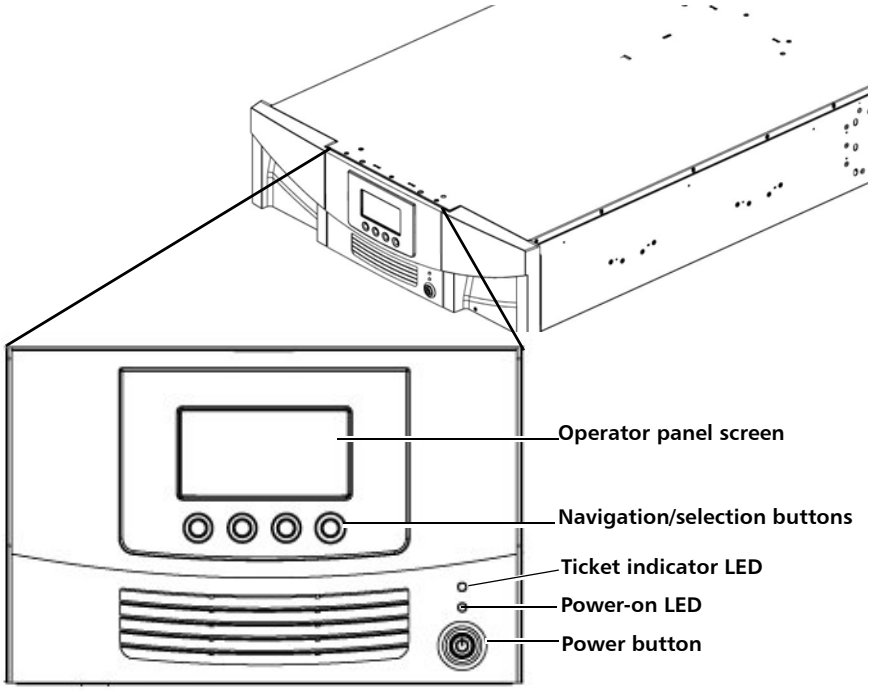


Table 1 Front Panel Features

Feature	Description
Operator panel screen	The operator panel displays library status information and allows you to access the library menus. These menus allow you to view or change the library settings and run diagnostic tests. For more information, see Operator Panel on page 27.

Feature	Description
Four navigation/selection buttons	These buttons, in combination with the operator panel display, are used to scroll through screens and select options or commands. The functionality of these buttons changes depending on the currently displayed operator panel screen.
Ticket indicator LED	Indicates whether a diagnostic ticket exists on the library. See Front Panel LEDs on page 251 and About Diagnostic Tickets on page 244 for more information.
Power-on LED	Indicates whether library power is on or off. See Front Panel LEDs on page 251 for more information.
Power button	Push-button that turns the library on or off. Turning off the library using the power button turns off the robot and operator panel, but power still runs to the power supplies. See Shutting Down, Restarting, Turning Off, and Removing Power on page 107 for instructions on how to shut down the library safely.

Robotic System and Barcode Scanner

The robotic system identifies and moves the cartridges between the storage slots, tape drives, and the I/E station. The robotic arm (picker) has picker fingers that enable it to grab tape cartridges and move them into and out of slots and tape drives.

A barcode scanner is attached to the library's robotic hand. This barcode scanner automatically identifies the slots and cartridges in the library, if the cartridges are fitted with acceptable barcode labels.

Each tape cartridge must contain a unique, matching-readable barcode that the barcode scanner reads during the inventory process. During the inventory process, the barcode scanner reads the barcode labels on the tape cartridges and empty slots to identify the types of tape cartridges that are installed in the library.

Tape cartridges cannot have duplicate barcode labels. This barcode identifies the cartridge. The library stores the physical location of the tape cartridge in an inventory database. All library or host requests typically reference the location of the tape cartridges based on this

barcode number. Barcode labels are mandatory and must adhere to specific standards. For more information on barcodes, see Chapter 10, Working With Cartridges and Barcodes.

Robots can only be replaced by a Quantum Support technician.

Magazines

Magazines are removable and contain storage and import/export station slots for cartridges. Each magazine has 20 slots, arranged in four columns of five slots each. The Scalar i40 contains two magazines; the Scalar i80 contains four. The right magazines provide up to five slots each for use as an import/export (I/E) station. For more information on I/E stations, see Configuring I/E Station Slots on page 63.

The library will run if one or more magazines is open or removed; however, it runs at reduced speed. The library will not move a cartridge to an open or removed magazine, but it will move a cartridge to any of the other installed magazines.

You can open the magazines using library software or manually. For information, see Releasing Magazines on page 114.

For information on removing and replacing magazines, see Removing and Replacing a Magazine on page 215.

Magazine Slot Location Coordinates

Each slot in the installed magazine is numbered with location coordinates. The library location coordinate contains three digits as follows: [Magazine],[Column],[Slot]. Figure 2 and Figure 3 show the magazines and list all of the location coordinates.

- **Magazine** — Library magazine level is represented by the first digit of a library coordinate. In a Scalar i40, there is only one level of magazine. The coordinate is always zero. In a Scalar i80 library, the bottom magazines are indicated by a zero; the top magazines are indicated by the number 1.
- **Column** — A storage column is a group of slots arranged vertically in the library. Columns are represented by the second digit of a library coordinate. Columns are identified relative to the front left of the library. The column in the front left of the library is number 1. The column numbering continues around the library in a clockwise direction. The I/E station column is always number 8.

- **Slot** — Slots (both storage and I/E station) are represented by the third digit of the library location coordinate. Within each magazine column, slots are numbered from 1 to 5, starting at the top of the magazine.

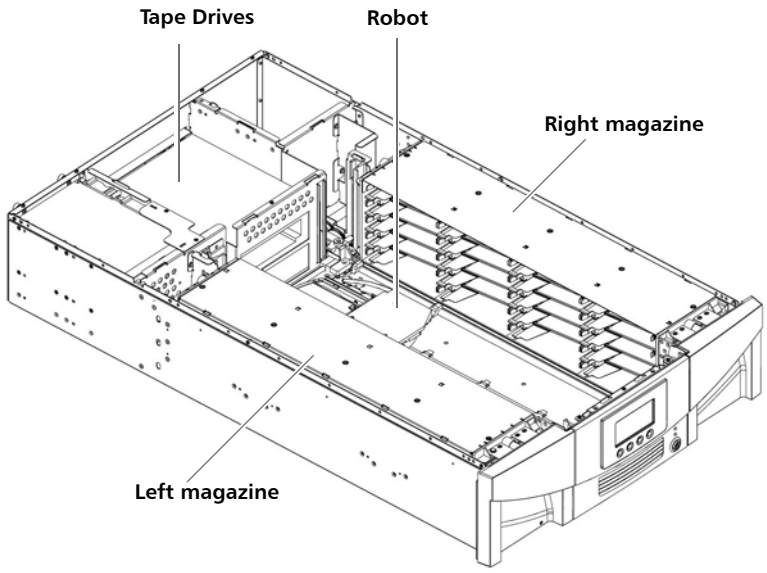


Figure 2 Scalar i40 Internal Layout and Magazine Slot Location Coordinates

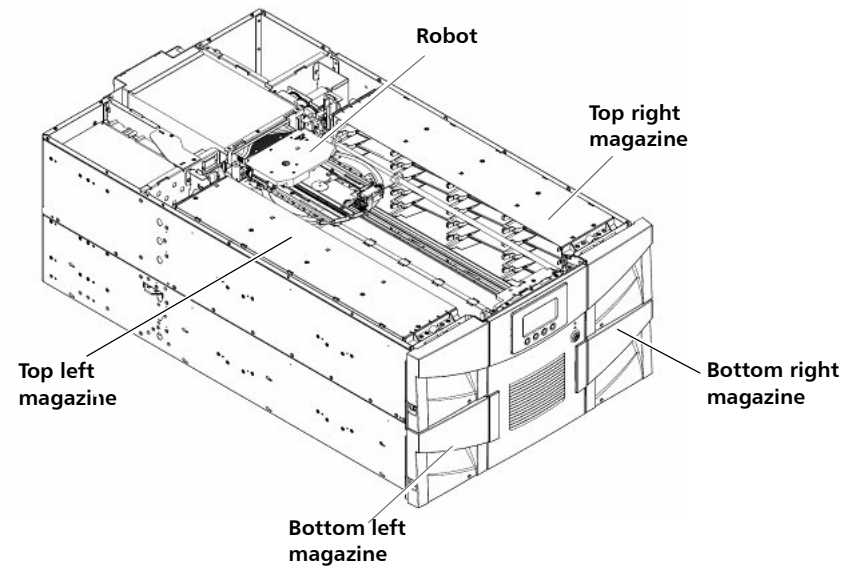
Left Magazine

0,1,1	0,2,1	0,3,1	0,4,1
0,1,2	0,2,2	0,3,2	0,4,2
0,1,3	0,2,3	0,3,3	0,4,3
0,1,4	0,2,4	0,3,4	0,4,4
0,1,5	0,2,5	0,3,5	0,4,5

Right Magazine

0,5,1	0,6,1	0,7,1	0,8,1
0,5,2	0,6,2	0,7,2	0,8,2
0,5,3	0,6,3	0,7,3	0,8,3
0,5,4	0,6,4	0,7,4	0,8,4
0,5,5	0,6,5	0,7,5	0,8,5

Figure 3 Scalar i80 Internal Layout and Magazine Slot Location Coordinates



Top Left Magazine

1,1,1	1,2,1	1,3,1	1,4,1
1,1,2	1,2,2	1,3,2	1,4,2
1,1,3	1,2,3	1,3,3	1,4,3
1,1,4	1,2,4	1,3,4	1,4,4
1,1,5	1,2,5	1,3,5	1,4,5

Top Right Magazine

1,5,1	1,6,1	1,7,1	1,8,1
1,5,2	1,6,2	1,7,2	1,8,2
1,5,3	1,6,3	1,7,3	1,8,3
1,5,4	1,6,4	1,7,4	1,8,4
1,5,5	1,6,5	1,7,5	1,8,5

Bottom Left Magazine

0,1,1	0,2,1	0,3,1	0,4,1
0,1,2	0,2,2	0,3,2	0,4,2
0,1,3	0,2,3	0,3,3	0,4,3
0,1,4	0,2,4	0,3,4	0,4,4
0,1,5	0,2,5	0,3,5	0,4,5

Bottom Right Magazine

0,5,1	0,6,1	0,7,1	0,8,1
0,5,2	0,6,2	0,7,2	0,8,2
0,5,3	0,6,3	0,7,3	0,8,3
0,5,4	0,6,4	0,7,4	0,8,4
0,5,5	0,6,5	0,7,5	0,8,5

Power Supply

The Scalar i40 and Scalar i80 libraries support single power configurations consisting of a single AC line input and single DC power supply. The Scalar i80 library supports a redundant power configuration consisting of a dual AC line input and dual DC power supplies.

If you have a Scalar i80 and are only using one power supply, the power supply should be installed in the upper power supply slot, and a filler plate must cover the empty power supply slot (see Figure 5 on page 9). If you are using redundant power, you can hot add or hot swap a power supply (power to the library remains on while you add or exchange the hardware).

The Scalar i40 power supply cannot be installed in a Scalar i80. However, the Scalar i80 power supply works in either the Scalar i40 or the Scalar i80.

Warning: The power outlet must be available near the library and must be easily accessible.

The power system consists of the following components:

- Power supply
- AC power cord

The power supply has one status LED. For more information, see Power Supply LED on page 255.

For information on removing and replacing power supplies, see Removing and Installing a Power Supply on page 220.

System Control Board

The system control board (SCB) contains the library firmware and processor. It manages the entire library, including the operator panel and robot, and is responsible for running system tests to ensure that the library is functioning properly. The SCB has two Ethernet ports:

- Left port — for remote management (Web client)
- Right port — for service only. In rare cases, you may need to change the IP address of the port if it conflicts with your library IP address (see Configuring the Service Port on page 77).

See Figure 4 on page 9 and Figure 5 on page 9 for port locations.

The SCB contains one LED, in addition to two LEDs on each Ethernet port (for a total of 5 LEDs). For more information, see System Control Board LEDs on page 252.

For information on removing and replacing the SCB, see Removing and Replacing the System Control Board on page 223.

Tape Drives

Every library configuration must contain at least one tape drive.

See Appendix A, Specifications for a list of tape drives and media supported by the Scalar i40 and Scalar i80 libraries.

The library supports mixing different tape drive types within the library and within partitions. For information on how to do this, see Working With Partitions on page 52.

Tape drives are installed into tape drive slots in the rear of the library. If a tape drive slot is empty, a filler plate must cover the empty slot (see Figure 5 on page 9).

Caution: Filler plates are required to maintain proper library cooling. Do not run the library with uncovered slots.

SAS tape drives have one status LED. Fibre Channel tape drives contain a status and a link LED. For more information on tape drive LEDs, see Tape Drive/Sled LEDs on page 253.

All tape drives contain only one cable connector.

For information on removing and replacing tape drives, see Removing and Replacing a Tape Drive on page 231.

Installed Tape Drive Location Coordinates

Installed tape drives have a two-digit location coordinate. These are the coordinates shown in the library configuration report. The first digit is always zero. The second digit indicates the location of the tape drive relative to the other tape drives. The bottommost tape drive has location coordinates [0,1], the next-to-bottom has location coordinates [0,2], and so on.

Figure 4 Scalar i80 Back Panel Components

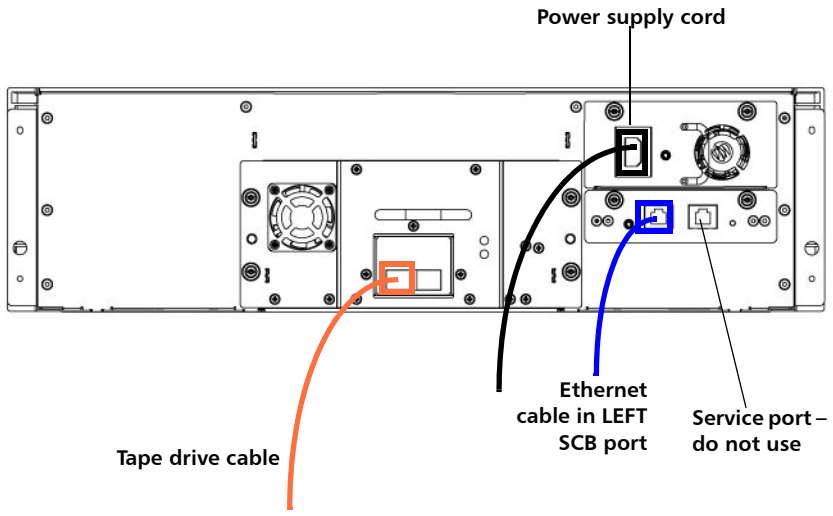
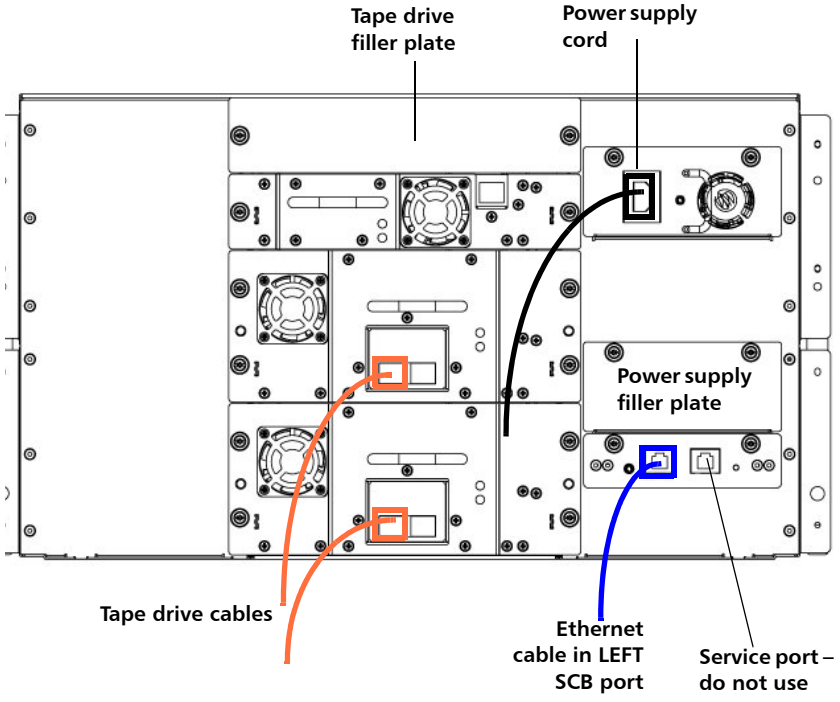


Figure 5 Scalar i80 Back Panel Components


Tape drive filler plate
Power supply cord
Power supply filler plate
Tape drive cables
Ethernet cable in LEFT SCB port
Service port – do not use

Standard Features

This section describes several features of Scalar i40 and Scalar i80 libraries.

User Interface

The operator panel is located on the front of the library and allows you to work locally on the library via the user interface. The Web client allows you to view and perform library functions from remote sites and is accessible through a browser. The operator panel and Web client contain a different user interface and functionality.

See Chapter 3, Understanding the User Interface for more information about the operator panel and the Web client.

Partitions

Partitions are virtual sections within a library that present the appearance of multiple, separate libraries for purposes of file management, access by multiple users, or dedication to one or more host applications.

Organizing the library into partitions divides the resources into virtual sections. If one of the resources is not available due to a failure or other cause, the other partitions and their assigned components are still available. Partitions can also be used to control access to portions of the library by granting permissions to user accounts to access certain partitions.

For more information on partitions, see Working With Partitions on page 52.

Control Path Modification

The control path tape drive is used to connect a partition to a host application. Only one tape drive can be selected as the control path at one time. By default, the first tape drive assigned to a partition is designated the control path. In the event that the control path connection to the host application fails, you can select a new control path for the partition. See Configuring Control Paths on page 67.

Support for WORM

Scalar i40 and Scalar i80 tape libraries support WORM (write once, read many) technology. WORM allows non-rewriteable and non-erasable data to be written and provides extra data security by prohibiting accidental data erasure. The WORM feature is supported whenever you use WORM cartridges.

Licensable Features

In addition to the standard features, the following additional, licensable features are available:

- Capacity on Demand (COD)
- Advanced Reporting

For information on how to obtain and install a license key, see Adding or Upgrading Licensable Features on page 68.

Capacity on Demand (COD)

All Scalar i40 and Scalar i80 library configurations ship with the purchased number of slots pre-activated. After the initial purchase of your library, you can activate any remaining inactive slots in your library by purchasing a COD license upgrade.

- The Scalar i40 base configuration has 25 slots activated. You can buy a COD license to activate the remaining 15 slots.
- The Scalar i80 base configuration has 50 slots activated. You can buy a COD license to activate the remaining 30 slots.

To see your library's current configuration and slot availability, open the Library Configuration Report (choose **Reports > Library Configuration** from the Web client).

Advanced Reporting

Advanced Reporting provides the following reports that you can configure for viewing and analysis:

- **Drive Resource Utilization Report**—Provides tape drive usage information, showing you which tape drives are working at

optimum capacity and which are under-utilized. This can help you allocate your tape drive resources properly.

- **Media Integrity Analysis Report**—Provides Tape Alert count for various combinations of tape drives, tape cartridges, and Tape Alert flags. This can help you determine if a problem is due to a specific tape drive or tape cartridge.

For information on how to use the advanced reporting capabilities, see Using Advanced Reporting on page 152.

The Advanced Reporting license applies to your entire library, regardless of library size. This means you only need to purchase the license once. If you increase the size of your library, your existing license applies to your new library configuration.

Chapter 2

Initial Installation and Setup

This chapter covers how to set up your library for the first time and get it ready for use, including:

- Unpacking the Library
- Accessory Kit Items
- Turning the Library ON and Configuring Network Settings
- Accessing the Library Via the Web Client

Required Tools and Equipment

- Ethernet cable

Before You Begin

Refer to the following sections of this manual for important information that you need when installing and setting up your library:

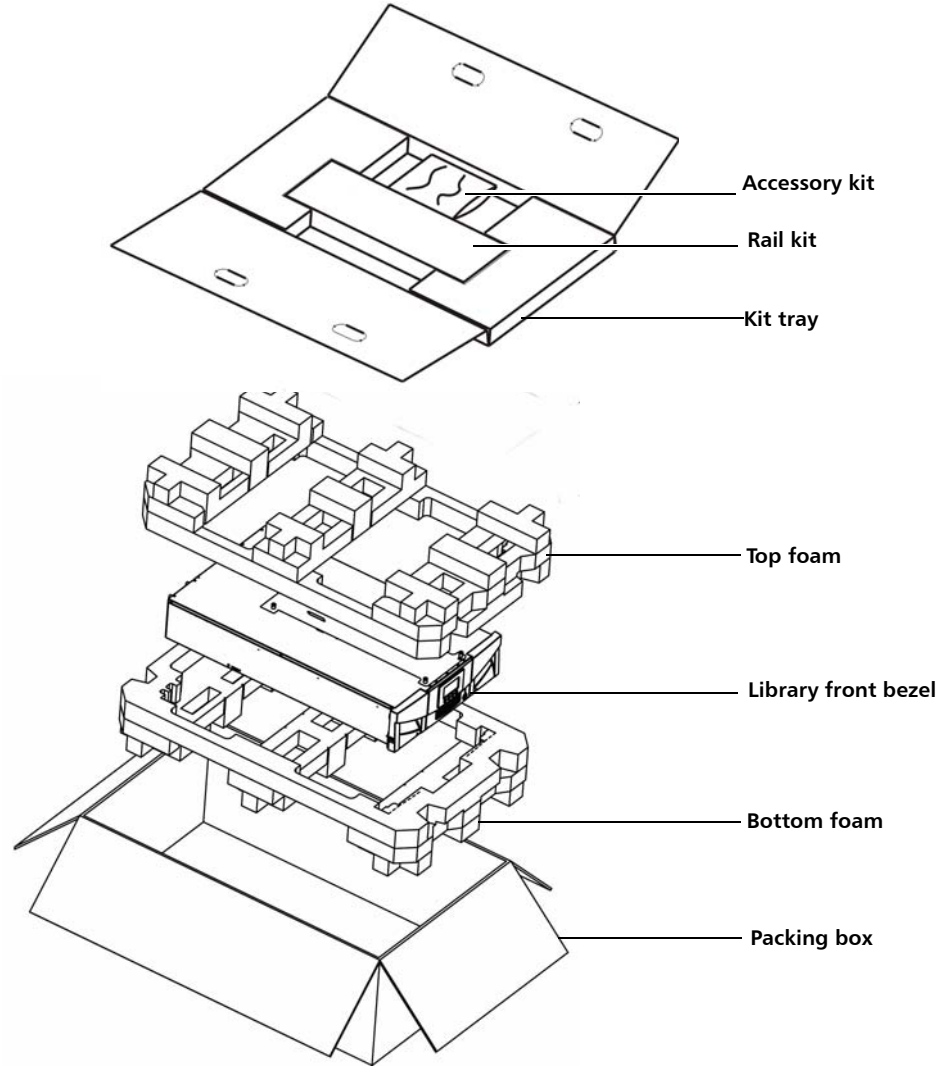
- Environmental Specifications on page 271
- Taking ESD Precautions on page 172

Unpacking the Library

Note: Unpack the library as close to the installation location as possible.

1. Inspect the outer library packaging for damage. If there is any damage evident on the library packaging, do not continue with the installation and contact Quantum customer support.
2. Open the library packing box and remove the accessory kit and the rail kit box (see Figure 6). Some configurations come with tape drives installed in the library, and some come with tape drives packaged separately. If yours comes with tape drives packaged separately, remove them and set aside for installation later.

Figure 6 Packaging



3 With the help of a second person, lift the library chassis out of the shipping carton and place it on a table approximately waist high.

WARNING: Two people are required to safely lift the library out of its packaging or into a rack.

Caution: Lift the library chassis at the sides. Avoid putting the weight of the library chassis on the front bezel.

4 Remove the anti-static wrapping from the library. Keep the anti-static wrapping intact so that you can use it later if needed.

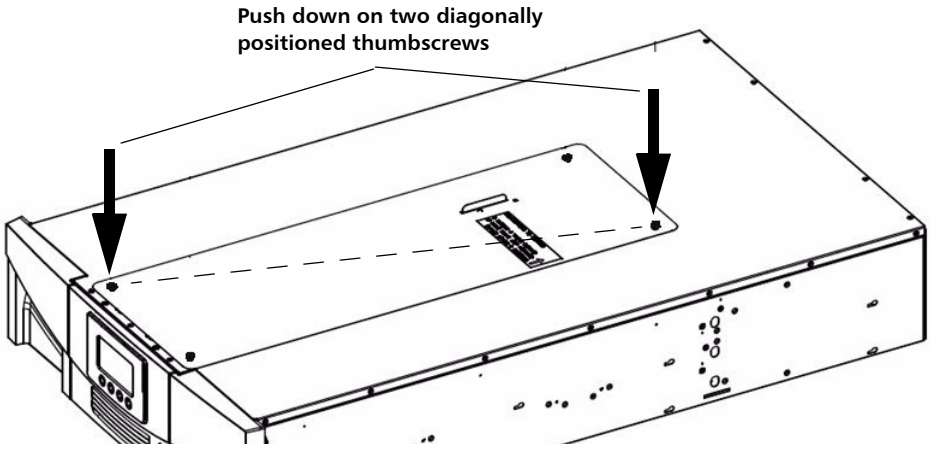
5 Save the packing box, packaging material, and anti-static wrapping in case you need to move or ship the library in the future.

6 Remove the robot restraint. The robot restraint consists of four (4) thumbscrews, a mylar sheet, and a small metal clip, located on the top cover of the library. See Figure 7 and Figure 8.

   a Partially unscrew (about 3 or 4 turns) all four thumbscrews, but do not remove them.

   b Using your fingers, carefully push down on two diagonally positioned thumbscrews. Push them down as far as they will go. This ensures that the robot can initialize freely. See Figure 7.

Figure 7 Pushing Down on Thumbscrews to Release Robot

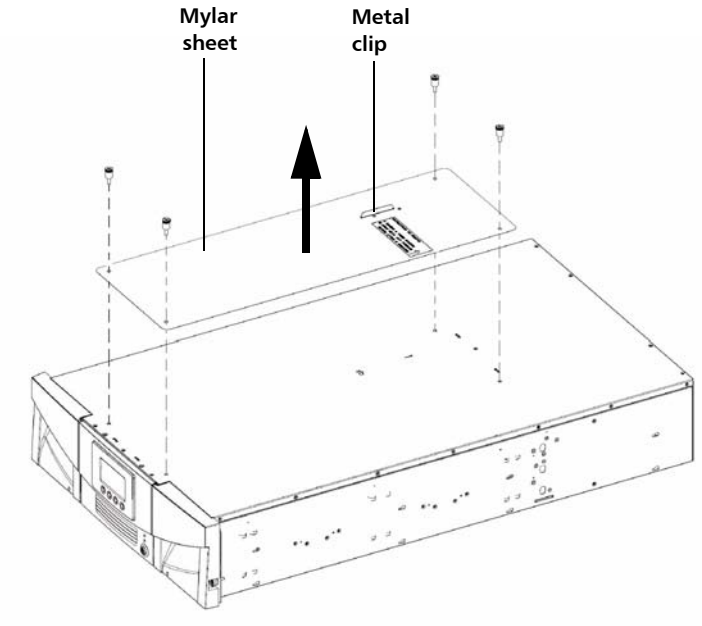


   c Completely unscrew and remove the four thumbscrews from the top cover (see Figure 8). Save the thumbscrews in case you need to move or ship the library in the future.

Note: The robot may stay at the top of the library, or it may move downward toward the floor of the library. If it moves downward, you will hear the gears turning as it moves. This is normal.

d Remove the mylar sheet and metal clip and discard. You will not need to use them again.

Figure 8 Removing the Robot Restraint



7 Remove the protective plastic sheet covering the front panel display.

Accessory Kit Items

Open the accessory kit and make sure all of the following items are present:

- Power cord(s) – one for each power supply
- *Scalar i40 and Scalar i80 Documentation and Training CD*
- *Scalar i40 and Scalar i80 Quick Start Guide*
- *China RoHS* statement
- *System, Safety, and Regulatory Information Guide*
- 2.5 mm Allen wrench (for installing the rail kit)
- 3 mm Allen wrench (for installing the rail kit)

Installing the Library in a Rack or Desktop Kit

Follow the instructions in Installing the Rack Mount Kit (Rail Kit) on page 174 or Installing the Library in a Desktop Kit on page 189.

Installing Tape Drives

If your library did not come with all tape drives installed, follow the instructions in Installing a Tape Drive on page 233.

Connecting the Cables

Follow the instructions for connecting the cables in Connecting Library Cables on page 173.

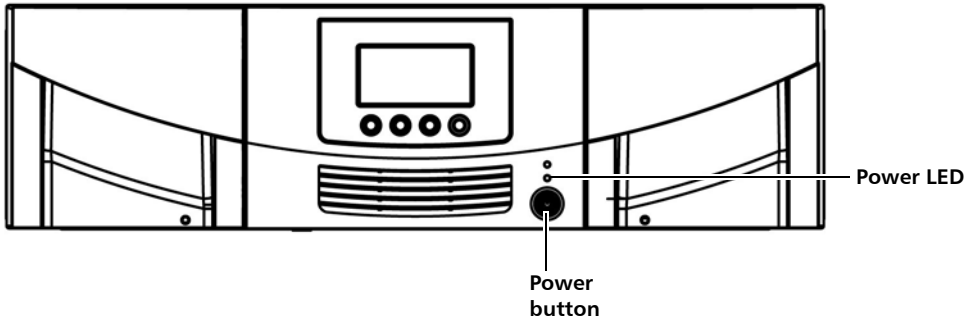
Turning the Library ON and Configuring Network Settings

Caution: Before turning the library on, make sure you removed the shipping restraint (4 thumbscrews, mylar sheet, metal clip) from the top of the library! Otherwise, the library will not initialize. See Figure 8 on page 17.

1 Turn the library **ON** by pressing the power button on the front bezel (see Figure 9).

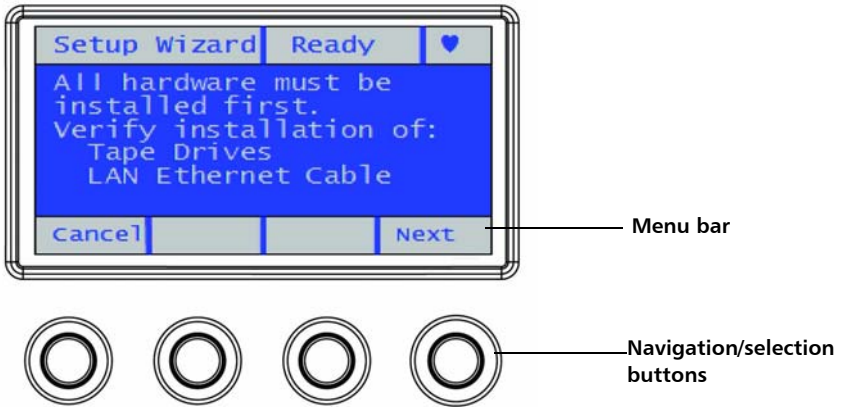
- The green power LED on the front panel above the power button illuminates, and the LCD screen turns on. The library goes through a connection and initialization sequence. This can take 5 to 17 minutes, depending on the size of your library.
- The status LED on the rear of each drive sled turns green during initialization.

Figure 9 Turning on the Library



2 When initialization completes, the **Setup Wizard** screen appears on the operator panel (see Figure 10). The operator panel screen contains a menu bar with operations that correspond to the four physical buttons below it. The menu operations and button functions change with each screen.

Figure 10 Setup Wizard – Initial Screen



3 Before proceeding, verify the Ethernet cable is connected and all of your tape drives are installed.

4 Do one of the following:

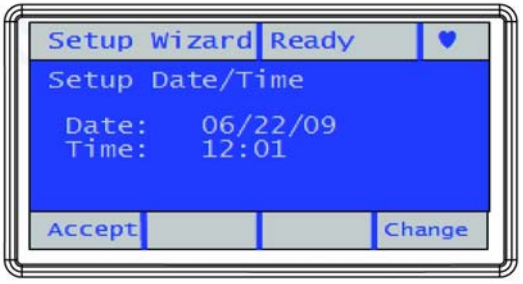
- To configure basic network settings using the Setup Wizard, press the button below **Next** on the menu bar. You will be guided through a series of screens where you can accept or change the default configuration settings (date, time, IP address, licenses, partitions, I/E station slots, and cleaning slots). Once you accept a setting, you move to the next one.

Remember that you can always change the configuration later if needed.

- To cancel out of the Setup Wizard and begin using the library immediately, press the button below **Cancel** on the menu bar. This accepts the library's default configuration, including an IPv4 address assigned by DHCP (see Default Configuration on page 42). You can change any of the configuration settings later using the **Setup** menus on the operator panel or the Web client. It is easier to configure the library using the Web client, so you may wish to cancel now. To access the Web client immediately, skip the rest of this section and go to Accessing the Library Via the Web Client on page 25.

5 The **Setup Date/Time** screen appears (see Figure 11).

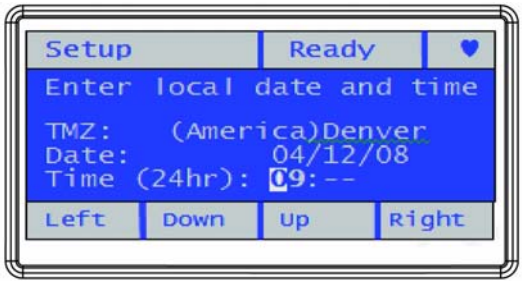
Figure 11 Setup Wizard – Date/Time Screen



Do one of the following:

- To accept the date and time, press the **Accept** button.
- To change the date or time, press the **Change** button. The **Date** field becomes available to edit and the menu bar button designations change. Use the **Left** and **Right** buttons to move through the date field, one digit at a time. Use the **Up** and **Down** buttons to change each digit of the date value. As you press **Right**, each digit of the date fills in. Continue to press the **Right** button to go to the **Time** field and edit it the same way. See Figure 12. When you reach the last digit of the Time field, the **Right** button designation changes to **Apply**. Press the **Apply** button. The new date and time display, and you can **Accept** or **Change**. Once you press **Accept**, you move to the next step.

Figure 12 Changing the Date and Time



Note: You cannot change the time zone on the operator panel. You can change it later using the Web client.

6 The **Setup Network** screen appears, listing a default host name (which you cannot change here but you can change later on the Web client) and an IPv4 address assigned by DHCP (see Figure 13).

Figure 13 Setup Wizard – Setup Network Screen

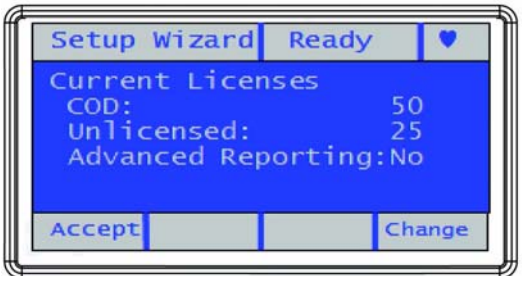
Do one of the following:

- To accept the IP address, press the **Accept** button.
- To change the IP address, press the **Change** button. Complete the network configuration screens and press **Accept** when finished.
  - If you accept IPv4 as the protocol, you can choose to get an IP address via DHCP or enter a static IP address. If you choose DHCP, the IP address, mask, and gateway are displayed. If you choose not to use DHCP, use the directional buttons as described in Step 5 on page 21 to enter a static IP address, mask, and gateway.

- If you choose IPv6 as the protocol, the library supplies a stateless IPv6 address and displays it, along with other network settings, on two screens. Use the **Next** and **Back** buttons to view the screens. You can only change these settings via the Web client.

7 The **Current Licenses** screen appears, which lists the number of licensed and unlicensed slots in the library and whether an Advanced Reporting license is installed (see Figure 14). If you ordered Capacity on Demand (COD) or Advanced Reporting features, they may already be installed on your library, depending on the library configuration you ordered. If they are not installed, you will have received, separately, a License Key Certificate containing instructions on how to retrieve your license key from the Quantum Web site. Once you have retrieved your license key, you may add it now or any time later. (If you did not receive your License Key Certificate, contact Quantum Support.)

Figure 14 Setup Wizard – Licenses Screen



Do one of the following:

- To accept the settings and go to the next step, press **Accept**.
- To change the settings, press **Change**. You can only change the settings if you have a new license key to enter. If you have a license key, press **Add**, then enter the license key using the directional buttons as described in Step 5 on page 21 and press **Accept** when complete. If you need to add another license key, perform the Change operation again.

8 The **Current Configuration** screen appears, displaying the default number of partitions, I/E station slots, and cleaning slots (see Figure 15).

Figure 15 Setup Wizard – Current Configuration Screen

Do one of the following:

- To accept the current settings, press **Accept**.
- To change any of the settings, press **Change**. This will delete the current partitions, and you are asked to confirm you want to do this. If you agree, the library deletes the partitions, which take about 30 seconds. When the partitions are deleted, you are guided through several more screens to change the number of partitions, I/E station slots, and cleaning slots. Use the directional buttons as described in Step 5 on page 21 and press **Accept** when complete.
  - Partitions — The minimum number of partitions you can create is one. The maximum is equal to the number of tape drives installed in the library. The library assigns resources proportionately among the partitions. You can change resource allocation later via the Web client. For details, see Working With Partitions on page 52.
  - I/E Station Slots — You can create a maximum of five I/E station slots on a Scalar i40 and a maximum of ten on a Scalar i80. The minimum is zero. Be aware that if you configure zero I/E station slots, you will not be able to import and export tape cartridges.
  - Cleaning Slots — You can configure a minimum of zero and a maximum of four cleaning slots.

9 The Setup Wizard is complete (see Figure 16). Press the **Exit** button.

Figure 16 Setup Wizard Complete

Accessing the Library Via the Web Client

It is recommended that you use the Web client to perform most library functions. The Web client is easier to use than the operator panel, and it presents more information and options than the operator panel does.

To access the library via the Web client:

1 From the operator panel, press the **Reports** button.

2 Press the **Down** button until **Network Settings** is highlighted.

3 Press the **Select** button.

4 Make note of your library's IP address that is displayed on the screen.

5 Enter the IP address in your Internet browser to bring up the library's Web client login screen.

6 Enter the default user name: **admin**

7 Enter the default password: **password**

8 Click **OK**.

Configuring Partitions

You may wish to configure partitions via the Web client if the Setup Wizard could not set them up exactly as you want them. To configure partitions, see Working With Partitions on page 52.

Importing Tape Cartridges

See Importing Tape Cartridges on page 117 and Bulk Loading Tape Cartridges on page 121 for instructions on how to import cartridges into the library.

Saving the Library Configuration

Save the library configuration every time you change the configuration or firmware. For instructions, see Saving the Library Configuration on page 101.

Configuring the Host Software

Before you can use the library for backup, you need to configure your host application. Refer to your host software documentation for instructions on configuring your host.

Chapter 3

Understanding the User Interface

The user interface for the Scalar i40 and Scalar i80 libraries is available in two formats: the operator panel and the Web client. Operations on the library can be performed locally on the operator panel or remotely on your computer using the Web client.

Both the operator panel and Web client user interfaces are required to operate the library. Some functionality is only available through the Web client, and some functionality is only available through the operator panel. However, it is recommended that you use the Web client rather than the operator panel to perform most library operations.

This chapter covers:

- Operator Panel
- Web Client
- Menu Trees

Operator Panel

The operator panel is located on the front panel of the physical library. The operator panel screen contains a menu bar with operations that correspond to the four physical buttons below it. The menu operations and button functions change with each screen.

Operator Panel Layout and Functions

Figure 17 shows the operator panel user interface. Table 2 describes the operator panel functions.

Figure 17 Operator Panel User Interface - Home Page

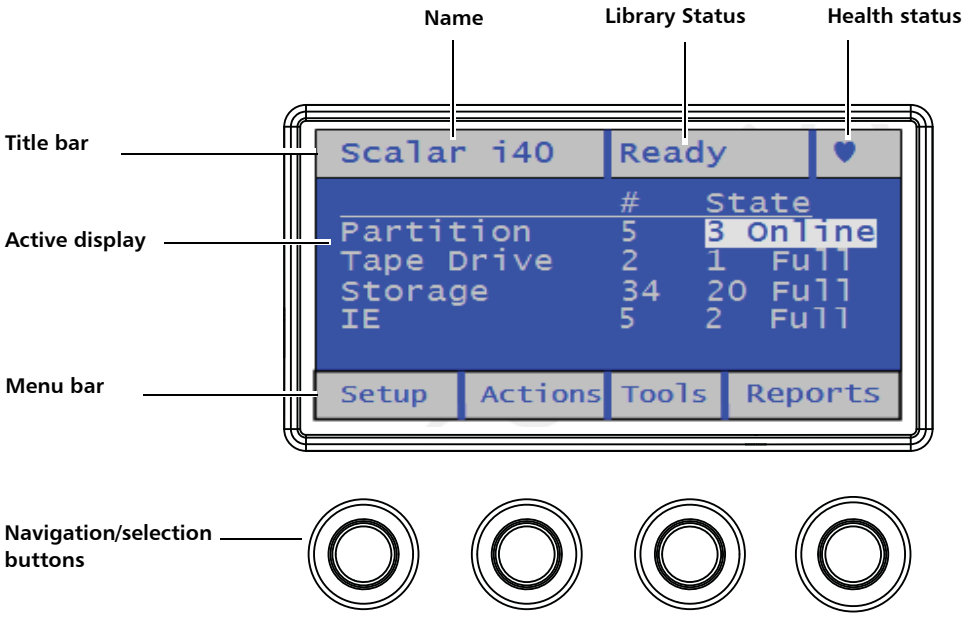


Table 2 Operator Panel Functions

Operator Panel Element	Description
Title bar	The title bar is present on every screen, and contains three fields: name, library status, and diagnostic ticket status.

Operator Panel Element	Description
Name	The name field changes depending on the menu selection. On the home page, this field displays the library type (Scalar i40 or Scalar i80). On active menu pages, the field displays the name of the menu or function of the screen. On diagnostic ticket pages, it displays the subsystem that the diagnostic ticket refers to (library, tape drives, or media).
Library status	The library's current status. The status can be any of the following: • Init – The library is currently in the process of initializing. • Ready – The library's robotics are operational. • Not Ready – The library's robotics are not ready.
Health status	The health status field displays an icon representing the health of the library. **Heart** — Library is in good health (no open or unopened diagnostic tickets are present). **Triangle** — Library health is degraded (library contains open or unopened low- or high-priority diagnostic tickets). **Exclamation point** — Immediate attention is required (library contains open or unopened urgent diagnostic tickets).
Active display	The active display provides information or menu items according to the selected menu item or operation.
Menu bar	The menu bar displays the function associated with each of the navigation/selection buttons. The button function changes with each menu. Common functions are navigation (up, down, left, right, next) and menu selection (select, apply, exit, yes, no, cancel).

Operator Panel Element	Description
Navigation/ Selection Buttons	The physical buttons enable you navigate menus and start and stop library operations according to the functions listed in the button bar. Not all buttons are functional for every operation. See Navigating and Editing on the Operator Panel on page 30 for more information.

Navigating and Editing on the Operator Panel

You use the four navigation/selection buttons exclusively to move through the menus and commands on the operator panel.

From the home page, the menu bar lists the four main menu headings. Pressing the button corresponding to a menu item brings up the list of sub-menu items. The item you are currently on is highlighted. Press the buttons corresponding to **Up, Down**, **Left**, or **Right** to navigate to a desired menu item. As you move through the items, the highlighting moves with you so you always know which item you are on. Press the button corresponding to **Select** to select a highlighted item or action. This in turn brings up either another sub-menu, a screen where you can modify settings or perform operations, or a screen displaying information.

To edit a modifiable field, such as date, time, IP address, and so on, use the **Left** and **Right** buttons to move through the field, one digit at a time. Use the **Up** and **Down** buttons to change each the value of each digit or letter. When you reach the value you want, press the **Right** button. As you press **Right**, each digit fills in. If there are multiple fields, continue to press the **Right** button to go to the next field and edit it the same way. When you reach the last digit of the last field, the **Right** button designation changes to **Apply**. Press the **Apply** button. The new information displays. Press **Exit** to exit. For an example, see Figure 18 on page 31.

Figure 18 Changing the Date and Time

Web Client

The Web client interface is accessible from supported Web browsers (see Supported Internet Browsers on page 274).

To access the library from a remote location, the library must be connected to your network via an Ethernet connection. Simply enter the library's IP address in your Internet browser bar to access the Web client. See Configuring Network Settings on page 42 for information on setting the network configuration settings for remote use.

Tips

Keep the following tips in mind when using the Web client:

- You must disable Web browser popup blockers to use the Web client interface and the library's online Help. Add the Scalar i40 or Scalar i80's Internet Protocol (IP) address to the list of trusted/allowed sites on your Scalar i40- or Scalar i80-supported browser, so the Web client pages will automatically refresh.
- Do not use your Internet browser **Back** button to navigate the Web client pages. Instead, use the buttons provided within the Web client.

- Log out of the library before closing the Internet browser window when you are using the Web client. If you do not log out, the session will remain open. Clicking the close button (**X**) in the upper-right corner of the Web client closes the browser window but does not log you out.

Sorting Information In Tables

You can sort information displayed in tables if the table column heading is bold. Click the column heading and the information will sort. Click again to toggle from ascending to descending.

Web Client Layout and Functions

Figure 19 on page 33 shows the Web client interface. Table 3 on page 34 explains the Web client interface elements.

Figure 19 Web Client User Interface - Home Page

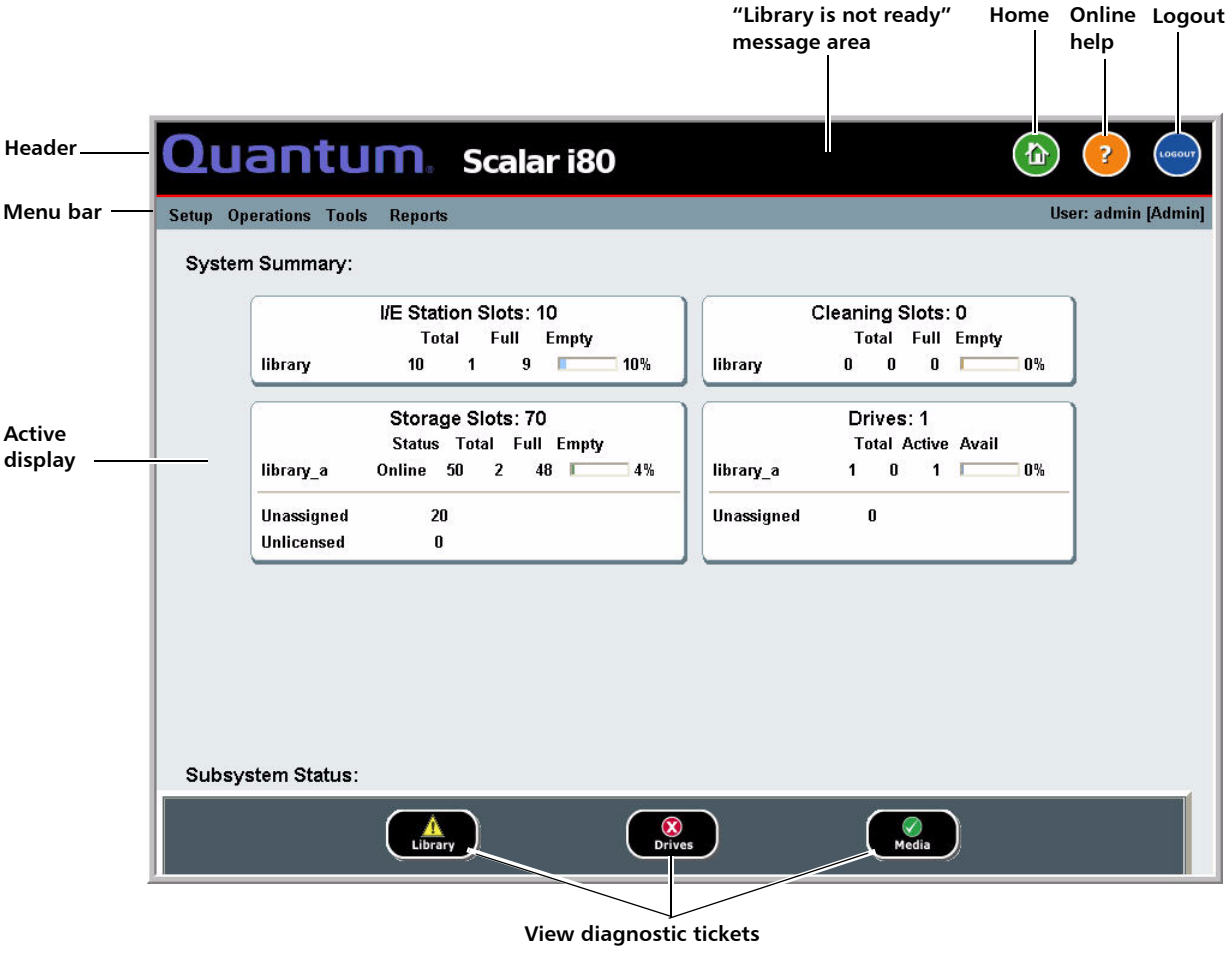


Table 3 Web Client Screen Elements

Web Client Element	Description
Header	The header is present on all pages and contains the library type (Scalar i40 or Scalar i80) and three buttons: **Home** — Brings you to the home page. **Help** — Displays the online help. **Logout** — Logs out of the current session. A message in the header alerts you when the robot is not ready to perform library functions. See Troubleshooting Library "Not Ready" Messages on page 248 for more information on "Library Not Ready" messages displayed in the header.
Menu bar	Displays the available menu choices. The choices vary depending on login privileges. The far right of the menu bar also displays the name of the logged-in user, with the associated privilege level indicated in brackets.
Active display	The active display provides information or menu items according to the selected menu item or operation.

Web Client Home Page

The home page displays status and health information in the active display portion of the window (see Figure 19 on page 33). See System Summary and Subsystem Status below for more information.

System Summary

The system summary is available on the home page of the Web client.

It provides tabular data on the capacity of the library's partitions, slots, and tape drives. It also displays whether partitions are online or offline

(in the Storage Slots section). The current user's login privileges determine which partitions are displayed (see Privilege Levels on page 80).

Subsystem Status

You can quickly gauge the health of the library by observing the color of the three subsystem status buttons located at the bottom of the home page. These buttons provide quick access to information about the "health" of the library for faster recovery if problems occur. You can select the buttons to view diagnostic tickets that report problems in the subsystems.

The three subsystems are:

- **Library** — This subsystem represents connectivity, control, cooling, power, and robotics.
- **Drives** — This subsystem represents tape drive components, such as tape drives, tape drive firmware, and tape drive sleds.
- **Media** — This subsystem represents media components, such as cartridges and barcode labels.

Each button has three states indicated by color. The three states are:

Green (check mark) — No diagnostic tickets exist, or, if any tickets do exist, they have all been closed.

Yellow (exclamation point) — The library contains open or unopened, low or high priority diagnostic tickets.

Red ("X" mark) — The library contains open or unopened urgent diagnostic tickets.

If the color of a subsystem button is red or yellow, you can click the button to display the corresponding **Diagnostic Tickets** screen. This screen lists library, drives, or media tickets, depending on which button was selected. See About Diagnostic Tickets on page 244 for more information.

Menu Trees

The following menus organize operations and commands into logical groupings:

- The **Setup** menu consists of commands that users with administrative privileges can use to set up and configure various aspects of the library, including partitions, I/E station slots, cleaning slots, control paths, network settings, drive settings, users, notifications, date and time, licenses, library registration, and e-mail.
- The **Operations/Actions** menu consists of commands that enable users to change the library's mode of operations, import and export cartridges, load and unload tape drives, move media, lock or unlock the I/E station, log off, and shut the library down. The menu is called **Actions** on the operator panel and **Operations** on the Web client.
- The **Tools** menu consists of commands that you can use to maintain your library such as viewing diagnostic tickets, generating diagnostic logs, identifying drives, configuring the internal network, saving and restoring the library configuration, setting system and security settings, and updating firmware, and performing library diagnostics.
- The **Reports** menu provides various kinds of library information.

Administrative users have access to all menu commands, but users' privileges are more limited.

Figure 20 lists the operator panel menus. Figure 21 lists the Web client menus.

Figure 20 Operator Panel Menus

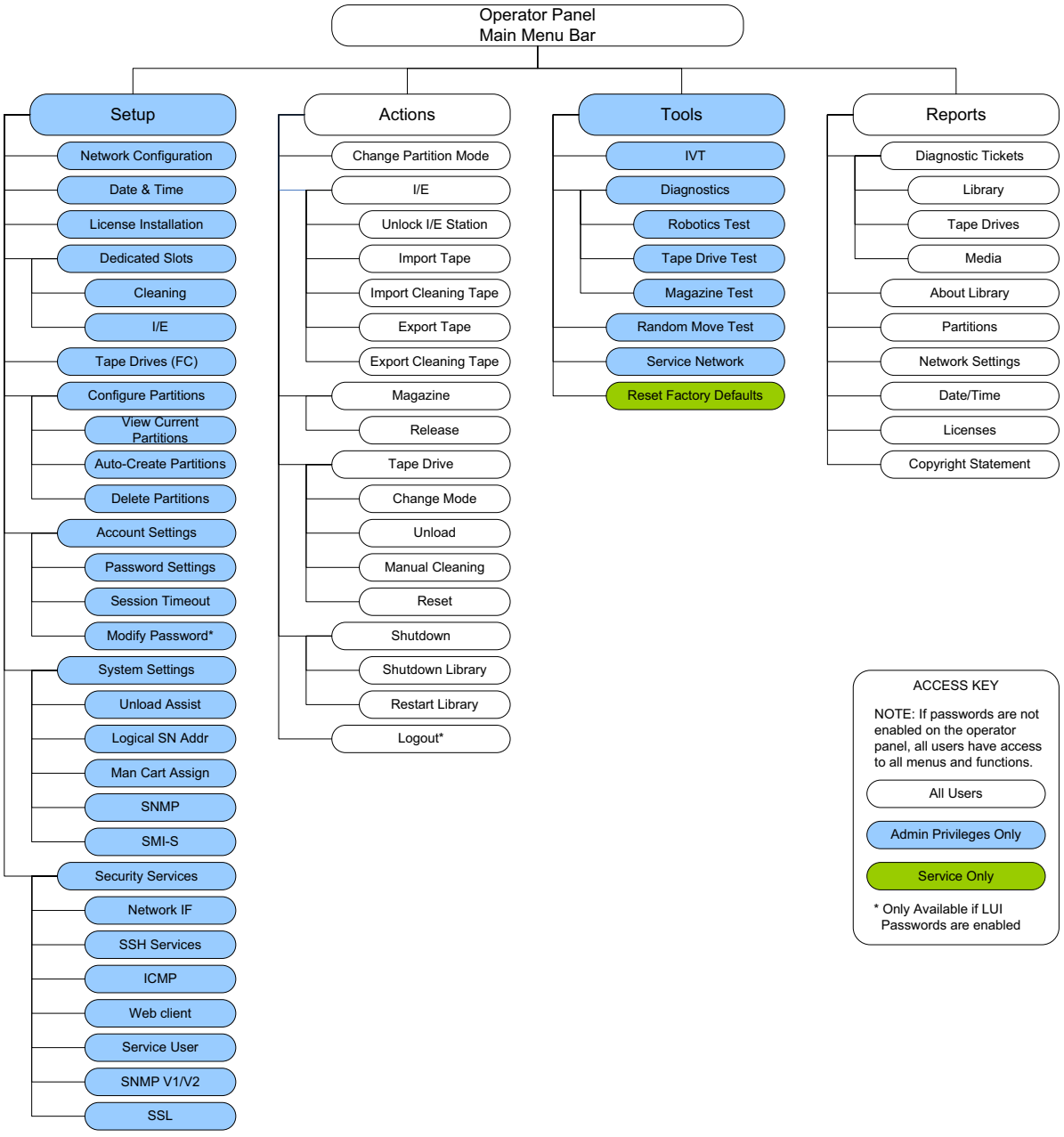
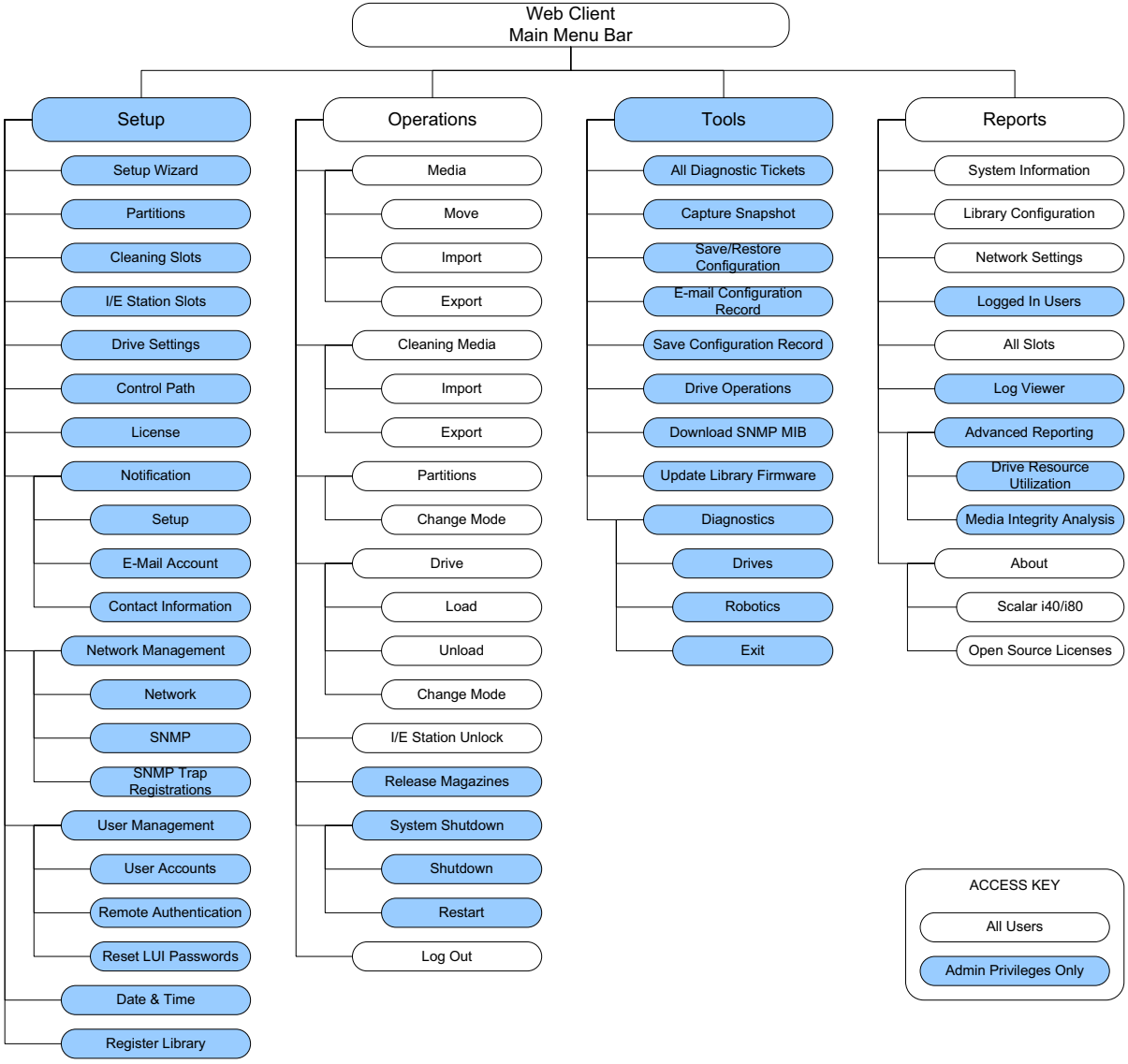


Figure 21 Web Client Menus



Chapter 4
Configuring the Library

A Setup Wizard is available to assist you with the initial configuration of the library. The Setup Wizard, however, contains only a subset of configuration tasks. The operator panel and Web client menus provide access to all configuration options that are included in the Setup Wizard and many that are not.

This chapter covers the Setup Wizard and all of the other configuration options. Paths to open the appropriate screens on both the operator panel and the Web client are given for each task. (For complete menu trees, see Menu Trees on page 36.)

Note: These operations should not be performed concurrently by multiple administrative users logged in from different locations. You can access the screens, but you cannot apply changes while another administrative user is performing the same operation.

Caution: Always save the library configuration after modifying a configurable item. This will allow you to restore the most current settings if necessary. See Saving and Restoring the Library Configuration on page 100.

Note: Power cycling (powering the library on and off) is not necessary to configure the library.

This chapter covers:

- Using the Setup Wizard
- Configuring Network Settings
- Configuring SNMP Settings
- Setting the Date, Time, and Time Zone
- Working With Partitions
- Configuring Cleaning Slots
- Configuring I/E Station Slots
- Configuring Tape Drive Parameters
- Configuring Control Paths
- Adding or Upgrading Licensable Features
- Working With E-mail Notifications
- Configuring the Library E-Mail Account
- Setting Customer Contact Information
- Configuring the Service Port
- Working With Local User Accounts
- Working With LDAP User Accounts (Remote Authentication)
- Setting the Session Timeout
- Configuring System Settings
- Configuring Security Settings
- Saving and Restoring the Library Configuration
- Registering the Library

Using the Setup Wizard

When you first power on the library, the operator panel displays the Setup Wizard, which walks you through the initial configuration of the library's basic operational settings.

The Setup Wizard on the operator panel appears when you first install your library. It appears once only. It will also appear after SCB replacement, resetting factory defaults, or downgrading library firmware. You must either complete the Setup Wizard or cancel out of it. If you cancel, you accept the library's default configuration (see Default Configuration). You can modify the default configuration at any time later using the Setup Wizard on the Web client, or by using the Setup menu options from the operator panel or Web client.

Operator Panel

The Setup Wizard on the operator panel is covered in detail in Chapter 2, Initial Installation and Setup.

Web Client

Click **Setup > Setup Wizard**. Work through several screens that enable you to add licenses; set date, time, and time zone; configure cleaning slots; configure I/E station slots; and auto-create partitions.

Default Configuration

The library comes with a default configuration, which you can modify at any time. The default configuration is as follows:

Feature	Default Configuration
Library host name	library
Network settings	IPv4, DHCP enabled IPv6 disabled
Number of partitions	Equal to the number of installed tape drive types (Fibre Channel or SAS). Storage slots are divided equally among the partitions.
Number of I/E station slots	5
Number of cleaning slots	0

Configuring Network Settings

The operator panel Setup Wizard allows you to configure network settings that allow remote access to the library from the Web client. At a minimum, you must initially configure the network IP address from the operator panel. After the initial configuration, you can modify the network settings from either the operator panel or the Web client.

Note: Changing the network settings may interrupt the library connection and library communication. Your current browser session may become invalid. If this happens, you must close your browser and then restart it to reconnect to the library with your new configuration settings.

Note: Make sure that the library is connected to the network before modifying network settings. If the Ethernet cable is not installed properly, you cannot configure the network settings. Install one end of the Ethernet cable in the left-most Ethernet port of the system control board (SCB) located on the back of the library. Make sure the other end of the Ethernet cable is installed in the appropriate LAN port on your LAN.

You can configure the following network settings. Some settings are only available on the Web client; others are only available on the operator panel, as described below.

Library Host Name

The host name is the network name you want to assign to the library. The library name is limited to 12 lowercase alphanumeric characters and dashes (-).

You can view, but not modify, the library host name on the operator panel. To modify the library host name, you must use the Web client.

Web Client

1. Select **Setup > Network Management > Network**.
2. Type a name in the **Library Name** field, and click **Apply**.

DHCP

DHCP is enabled by default. When DHCP is enabled, the library obtains an IP address automatically. If DHCP is disabled, you must manually enter an IP address, default gateway, and subnet mask/net prefix. You can enable/disable DHCP from the operator panel or Web client.

Operator Panel

Select **Setup > Network Configuration**.

Web Client

Select **Setup > Network Management > Network**.

IP Addresses

The library can support both IPv4 and IPv6 network settings at the same time. For more details see the bullets below.

Caution: If you change the IP address on your library, make sure to change it on any host applications that access the library.

Note: Be sure to add your library's IP address to the list of trusted/allowed sites on your library-supported browser, so the Web client pages automatically refresh.

- **IPv4 Addresses** — The library always supports IPv4 network settings. The library can support either a DHCP-obtained or a static IPv4 address.

  IPv4 addresses must be entered in dot notation (for example, 192.168.0.1). They are limited to numeric characters and do not allow values exceeding 255 for dot-separated values.

- **IPv6 Addresses** — IPv6 is disabled by default and can only be enabled/disabled via the operator panel. Once enabled, you must use the Web client to modify the address. Unlike IPv4, the library can support both DHCP-obtained and static IPv6 addresses at the same time.

  IPv6 addresses must be entered in the proper notation. IPv6 address can be entered in the most common notation, as eight groups of four hexadecimal digits. 2001:0ff8:55cc:033b:1319:8a2e:01de:1374 is an example of a valid IPv6 address. Also, if one or more of the four-digit groups contains 0000, you can omit the zeros and replace them with two colons (::), as long as there is only one double colon used in an address. Using this notation, 2001:0ff8:0000:0000:0000:0000:01de:1374 is the same as 2001:0ff8::01de:1374.

You can configure IPv4 addresses on the operator panel or Web client. You can set the library to use IPv6 via the operator panel, but you must use the Web client to configure a static IPv6 address.

Operator Panel

Select **Setup > Network Configuration**.

Web Client

Select **Setup > Network Management > Network**.

Default Gateway, Subnet Mask, Network Prefix, and DNS Addresses

- Default Gateway — The IP address of the default gateway for your portion of the Ethernet network. For IPv4, this setting can only be changed if DHCP is disabled.
- Subnet Mask (IPv4 only) — Available only if DHCP is disabled.
- Network Prefix (IPv6 only). Can be entered only on the Web client.
- Primary DNS Address (optional, Web client only) — Must be entered as an IP address. This text box is available only if DHCP is disabled.
- Secondary DNS Address (optional, Web client only) — Must be entered as an IP address. This text box is available only if DHCP is disabled.

Operator Panel

Select **Setup > Network Configuration**.

Web Client

Select **Setup > Network Management > Network**.

Configuring SNMP Settings

Simple Network Management Protocol (SNMP) is a light-weight protocol designed for remote management and monitoring of infrastructure devices. The library provides SNMP support, so an external management application can be configured to receive library SNMP information. The library supports SNMP by publishing a Management Information Base (MIB) that can be queried to obtain the status of the library and many of its individual components. SNMP information can be obtained from the library using SNMP Traps and GET queries.

For more information about SNMP, see the *Scalar i40 and Scalar i80 Basic SNMP Reference Guide* (6-66773-xx).

For information on integrating MIBs with an SNMP management application, contact your network management application vendor.

Registering External Management Applications

Administrative users can register transport protocols, IP addresses, and port numbers of external management applications to enable them to receive SNMP traps from the library. (By default, the library ignores all SNMP SET operations, so external management applications cannot register themselves to receive SNMP traps from the library.)

After registering the transport protocols, IP addresses, and corresponding port numbers, you can perform a test to verify that the library can send the SNMP traps to the addresses.

When registering external management applications to receive SNMP traps, you can set the following parameters:

- Transport — The transport protocol. This should be the same as the transport protocol configured on the SNMP trap receiver. Select one of the following:
  - UDP - User Datagram Protocol for IPv4
  - UDP6 - User Datagram Protocol for IPv6
  - TCP - Transmission Control Protocol for IPv4
  - TCP6 - Transmission Control Protocol for IPv6
- Host Name/IP Address — The host name or the IP address of the external management application you want to register. A host name may be entered only if DNS is enabled. Otherwise, IP addresses must entered. For information on DNS, see Default Gateway, Subnet Mask, Network Prefix, and DNS Addresses on page 45.
- Port — the port number of the external application you want to register. The default port number for an external application is 162.

You can only perform these functions from the Web client.

Web Client

1 Select **Setup > Network Management > SNMP Trap Registrations**.

2 Click one of the following buttons to perform these actions:

- **Create** — Adds the IP address and port number of the external application to the list of registered addresses that will be sent SNMP traps.
- **Delete** — Deletes a selected IP address and port number.
- **Test** — This test simply sends the traps; it does not check to see if they were received. You must check the external management applications to verify that the traps were received.

Enabling SNMP Versions

The library supports SNMP v1, v2c, and v3.

You can enable or disable support for SNMP v1 and v2c. They are enabled by default. The recommended practice is to disable SNMP v1 and SNMP v2c in highly secure environments.

SNMP v3 is always enabled and cannot be disabled.

The authentication algorithm is set to MD5, and the encryption is disabled system-wide.

Operator Panel

1 Select **Setup > Security Services > SNMP V1/V2**

2 Press **Modify**.

3 Scroll to select **Enabled** or **Disabled** and press **Apply**.

4 Press **Exit**.

Web Client

1 Select **Setup > Network Management > SNMP**.

2 Select the **SNMP V1 and V2c enabled** check box to enable SNMP v1 and v2c. Clear the S**NMP V1 and V2c enabled** check box to disable SNMP v1 and v2c.

Enabling SNMP Authentication Traps

The library allows you to enable or disable SNMP authentication traps. When the library receives an SNMP message that does not contain the correct community string or other authentication information, the

library sends an SNMP authentication trap message to the external management application, indicating the authentication failure. SNMP authentication traps are disabled by default.

Web Client

1. Select **Setup > Network Management > SNMP**.
2. Select the **SNMP Authentication Traps** check box to enable SNMP authentication traps. Clear the **SNMP Authentication Traps** check box to disable SNMP authentication traps.

Modifying the SNMP Community String

Administrative users can modify the SNMP community string. The SNMP community string is a text string that acts as a password to authenticate GET and GET-NEXT SNMP v1 and SNMP v2c messages exchanged between the library and an external management application. The SNMP community string used by the library must match the string used by the external management application.

The default SNMP community string on the library is: **publicCmtyStr**. For security purposes, this string should be modified. When modifying the community string, adhere to the following guidelines: the community string is case-sensitive, cannot be empty, and cannot exceed 32 characters.

You can only modify the SNMP community string from the Web client

Web Client

1. Select **Setup > Network Management > SNMP**.
2. Enter a new community string in the **SNMP Community** text box under **New Settings**.
3. Click **Apply**.

Downloading the SNMP MIB

The SNMP Management Information Base (MIB) is for library customers, partners, third-party management software developers, and other parties interested in integrating the Scalar i40 and Scalar i80 with commercial management frameworks. The Scalar i40 and Scalar i80

libraries support SNMP by publishing a MIB that can be queried to obtain the status of the library and many of its individual components.

Administrative users can download the SNMP MIB from the library. The MIB can then be installed on an SNMP external management application.

For more information about the library MIB, see the *Scalar i40 and Scalar i80 Basic SNMP Reference Guide* (6-66773-xx) or contact Quantum Support.

For information on integrating MIBs with an SNMP management application, contact your network management application vendor.

Web Client

1. Select **Tools > Download SNMP MIB**.
2. Save the file to a known location.

Setting the Date, Time, and Time Zone

You can either set the library date, time, and time zone settings manually or configure the Network Time Protocol (NTP). NTP allows you to synchronize the library date and time with other components in your IT infrastructure.

If NTP is enabled, the IP address of at least one NTP server must be configured. Contact your network administrator for NTP server IP address information.

You can configure the date and time on both the operator panel and the Web client. You can view the time zone on the operator panel, but must use the Web client to change it. You can only configure NTP settings on the Web client.

Note: The following operations should not be performed concurrently by multiple administrative users logged in from different locations. You can access the appropriate screens, but you cannot apply changes while another administrative user is performing the same operation.

Setting the Date and Time Manually

Date and time settings are used to log the date and time events take place and to set the time for automatic backup and restore functions. At a minimum, you should set the library's date and time as part of the initial library configuration.

The time is set to a 24 hour clock. For example, four o'clock in the afternoon is entered as 16:00.

Operator Panel

1. Select **Setup > Date & Time**.
2. Modify the date and time using the method described in Navigating and Editing on the Operator Panel on page 30.

Web Client

1. Select **Setup > Date & Time**.
2. Refer to the library Web client online help for detailed instructions. To view the help, click the **Help** icon in the upper right corner of the screen.

Setting the Date and Time Using the Network Time Protocol

The library supports the Network Time Protocol (NTP). NTP allows you to synchronize the library date and time with other components in your IT infrastructure. Administrative users can either modify the date and time zone settings manually or configure NTP.

If NTP is enabled, the time zone and IP addresses of at least one NTP server must be configured on the library. Contact your network administrator for NTP server IP address information.

Details on NTP settings include:

- At least one NTP server must be configured and available.
- NTP is enabled on the Date & Time screen. When NTP is enabled, you cannot manually configure date and time. For more information on setting date and time manually, see Setting the Date and Time Manually on page 50.
- You can enter an IP address for a primary and an alternate (optional) NTP server.

- NTP server IP addresses must be entered in the proper format. See Configuring Network Settings on page 42 for the proper format of IPv4 and IPv6 addresses.
- After you apply NTP settings, system clock synchronization may take several minutes.

You can only enable and configure NTP on the Web client.

Web Client

1. Select **Setup > Date & Time**.
2. Refer to the library Web client online help for detailed instructions. To view the help, click the **Help** icon in the upper right corner of the screen.

Setting the Time Zone

To select your time zone from a list, disable **Use Custom Time Zone** setting and select your time zone.

If your time zone does not appear on the list, or you want more control over your time settings, enable Use Custom Time Zone and set a Universal Coordinated Time (UTC) offset.

You can only set the time zone via the Web client.

Web Client

1. Select **Setup > Date & Time**.
2. Refer to the library Web client online help for detailed instructions. To view the help, click the **Help** icon in the upper right corner of the screen.

Setting Daylight Saving Time

If you selected your time zone from the drop-down list (see Setting the Time Zone on page 51), the library automatically adjusts for daylight saving time. There is no need to manually reset the clock for time changes.

However, if you set a custom time zone, the library will not automatically adjust for daylight saving time. You must enable the **Use Custom Daylight Saving Time** setting. Once enabled, you can set start and stop times to an accuracy of one minute.

You can only set daylight saving time on the Web client.

Web Client

1. Select **Setup > Date & Time**.
2. Refer to the library Web client online help for detailed instructions. To view the help, click the **Help** icon in the upper right corner of the screen.

Working With Partitions

Partitions are virtual sections within a library that present the appearance of multiple, separate libraries for purposes of file management, access by multiple users, or dedication to one or more host applications. The library must contain at least one unassigned tape drive and slot to create a partition.

There are two ways to create partitions:

- **Automatically** — Library resources are assigned proportionately among the partitions. Tape drives are grouped according to their interface type (FC or SAS). When you automatically create partitions, you add to the number of existing partitions. You can create partitions automatically on either the operator panel or the Web client. For more information, see Automatically Creating Partitions on page 53.
- **Manually** — An administrative user can create partitions one at a time. Creating partitions manually gives you more control over resource allocation. When you manually create partitions, you add to the number of existing partitions. You can only create partitions manually on the Web client. For more information, see Manually Creating Partitions on page 55.

You can modify a partition if you need to change its settings. For example, the partition name, emulation type, media barcode format (to report to host), and number of assigned tape drives and slots can be modified. For information on modifying partitions, see Modifying Partitions on page 57.

When a partition is no longer needed, it can be deleted. For information on deleting partitions, see Deleting Partitions on page 57.

Administrative users can create, delete, and control access to all library partitions. Users can be given access to only certain partitions and denied access to others. For information on changing partition access for users, see Changing Access to Partitions on page 59.

Details on partitions include:

- A partition consists of one tape drive and one slot at a minimum. The tape drive or slot cannot be shared with another partition.
- The default configuration for the library is one partition per tape drive interface type (Fibre Channel or SAS) installed in the library.
- Partition names are limited to 12 lower-case alphanumeric characters and underscores (_).
- The maximum number of partitions that can be created is equal to the number of tape drives in the library. The minimum number of partitions is one.
- Import/export (I/E) station slots are shared between all partitions. Partitions take temporary ownership of I/E station slots performing certain operations, such as importing and exporting cartridges.

Automatically Creating Partitions

Automatic partitioning assigns available library resources proportionately among the partitions, grouping tape drives according to their interface type (FC or SAS).

The library must contain at least one unassigned tape drive and one unassigned slot to automatically create a partition. If no unassigned tape drives or slots exist, you must modify or delete one or more partitions to free up resources. For more information, see Modifying Partitions on page 57 and Deleting Partitions on page 57.

You can select the number of partitions to create, from a minimum of one to a maximum that equals the number of unassigned tape drives in your library.

If you choose to create fewer partitions than the default, but more than one partition, some resources will not be assigned to a partition. However, if you choose to create one single partition, all available resources will be assigned to the one partition.

When the library automatically creates partitions, it assigns the first tape drive in the partition as the control path. You can change the control paths at any time. See Configuring Control Paths on page 67 more information.

Before automatically creating partitions, verify that all tape drives are unloaded and that all cartridges are in their appropriate storage slots. For information on unloading tape drives, see Unloading Tape Drives on page 127.

Operator Panel

1. Select **Setup > Configure Partitions > Auto-Create Partitions**.

   (If not available, you do not have available resources. Modify or delete partitions to create resources.)

2. Use the **Up** and **Down** buttons to select the number of partitions you want to create.
3. Press **Apply**.
4. Save the library configuration (see Saving the Library Configuration on page 101).

Web Client

1. Select **Setup > Partitions**.
2. Click **Automatic**. (If not available, you do not have available resources. Modify or delete partitions to create resources.)

   The **Automatically Create Partitions** screen appears.

   By default, the library applies the Scalar i40-i80 library emulation type and Standard media barcode format to each partition. You can change these settings by modifying the partition after it has been created (see Modifying Partitions on page 57).

3. Using the **Partitions** drop-down list, select the number of partitions to create.
4. Click **Apply**.

5 Save the library configuration (see Saving the Library Configuration on page 101).

Manually Creating Partitions

You can manually create partitions any time after the initial configuration of the library. The maximum number of partitions that can be created is equal to the number of tape drives in the library.

The library must contain at least one unallocated tape drive and one unallocated slot to manually create a partition. If no unallocated tape drives or slots exist, you must modify or delete partitions to free resources. For more information, see Modifying Partitions on page 57 and Deleting Partitions on page 57.

When the library automatically creates partitions, it assigns the first tape drive in the partition as the control path. You can change the control paths at any time. See Configuring Control Paths on page 67 more information.

Before automatically creating partitions, verify that all tape drives are unloaded and that all cartridges are in their appropriate storage slots. For information on unloading tape drives, see Unloading Tape Drives on page 127.

You can create partitions manually only on the Web client.

Web Client

1 Select **Setup > Partitions**.

2 Click **Manual**.

3 Type a name to describe the new partition into the **Enter Name** text box.

4 Select one of the following emulation types from the **Emulation Type** drop-down list:

- **Scalar i40-i80** (default)
- **ADIC Scalar i500**
- **Quantum Scalar i500**
- **Quantum Scalar i2000**
- **ADIC Scalar i2000**

5 Select one of the following media barcode formats (for reporting to host) from the **Set Media Barcode Format** drop-down list:

- **Standard Six** — Six character barcode number with or without a one or two-character media ID, for example, “XXXXXXL4” or “XXXXXX”. Only the six character barcode is reported to the host.
- **Plus Six** — Six character barcode number followed by a media ID, for example, “XXXXXXL3”. Six character barcode and media ID are reported to the host.
- **Extended** — Five to 15 characters total, including a barcode number and optional media ID. All characters are reported to the host, regardless of having a media ID or not. If a media ID is included, the label must have a five to 13 character barcode followed by a media ID, for example, “XXXXXXXXXXXXXL2”. If a media ID is not included, the label must have a five to 15 character barcode, for example, “XXXXXXXXXXXXXXX”.
- **Media ID Last** — Five to 13 character barcode number followed by media ID, for example, “XXXXXXXXXXXXXLT”. The media ID is reported to the host last.
- **Media ID First** — Five to 13 character barcode number preceded by media ID, for example, “L4XXXXXXXXXXXXX”. The media ID is reported to the host first.
- **Standard** — (default) Five to 15 characters total, including a barcode number and optional media ID. The media ID is not reported to the host. If a media ID is included, the label must have a five to 13 character barcode followed by a media ID, for example, “XXXXXXXXXXXXXL3”. If a media ID is not included, the label must have a five to 15 character barcode, for example, “XXXXXXXXXXXXXXX”.

6 Type the number of slots to assign to the new partition into the **Enter Number of Slots** text box.

7 Under the **Select Drives** section, assign one or more available tape drives to the partition by selecting the check box located to the left of the tape drive.

8 Click **Apply**.

9 Save the library configuration (see Saving the Library Configuration on page 101).

Modifying Partitions

You can modify partition settings any time after a partition is created. For example, you can modify the name, emulation type, media barcode format, and number of assigned tape drives and slots.

The library automatically takes the partition offline before modifying it and places it back online after it has been modified.

The tape drive set as the control path for a particular partition cannot be deleted from that partition. The check box associated with the control path is grayed out. For more information on setting the control path, see Configuring Control Paths on page 67.

Before modifying partitions, verify that all tape drives are unloaded and that all cartridges are in their appropriate storage slot location. For information on unloading tape drives, see Unloading Tape Drives on page 127.

You can modify partitions only on the Web client.

Web Client

1. Select **Setup > Partitions**.
2. Select a partition and click **Modify.**
3. Modify any of the settings. For a description of what each setting means, see Manually Creating Partitions on page 55.
4. Save the library configuration (see Saving the Library Configuration on page 101).

Deleting Partitions

A partition can be deleted when it is no longer needed. After a partition is deleted, its resources (tape drives and slots) become unassigned and can be used to create new partitions or added to existing partitions.

Before deleting a partition, unload cartridges from the tape drives within the partition and then export all cartridges from the partition. Remove the cartridges from the I/E station after exporting them. For information on unloading tape drives, see Unloading Tape Drives on page 127. For information on exporting cartridges, see Exporting Tape Cartridges on page 123s. You can also remove cartridges by releasing the magazine and removing them by hand (see Releasing Magazines on page 114). If you do this, be sure to only remove cartridges assigned to

that partition (see Viewing the Library Configuration Report on page 141).

After a partition is deleted, its resources (for example, tape drives and slots) become available and can be reassigned to new or existing partitions.

Deleting a partition does not delete users assigned to that partition. However, if these users are not assigned to other partitions, they will not be able to perform any library operations. For information on how to assign a user to another partition, see Changing Access to Partitions on page 59.

Note: You may need to modify settings in your host application as a result of deleting a partition. See your host application documentation.

You can delete partitions on both the operator panel and the Web client.

Operator Panel

1. Select **Setup** > **Configure Partitions** > **Delete Partition**.
2. Use the **Up** and **Down** buttons to select a partition from the list.
3. Press **Delete**.
4. Save the library configuration (see Saving the Library Configuration on page 101).

Web Client

1. Select **Setup** > **Partitions**.
2. Select a partition and click **Delete.**
3. Save the library configuration (see Saving the Library Configuration on page 101).

Viewing the Current Partitions

You can view basic details about all of your partitions, including online/offline status, control path tape drive, number of tape drives in the partition, number of storage slots, and number of I/E station slots available to the partition.

Operator Panel

1. Select **Reports > Partitions**.
2. Select a partition and press **Select**.

Web Client

You can view partition information in several places:

- Library home page (see Web Client Home Page on page 34)
- Library configuration report (see Viewing the Library Configuration Report on page 141).
- Partition modification screen (select **Setup > Configure Partitions**, select a partition, and click **Modify**).

Changing Access to Partitions

An administrative user can control which partitions a specified user can access by modifying the user's account on the Web client. For more information, see Working With Local User Accounts on page 78.

Web Client

Select **Setup > User Management > User Accounts**.

Taking a Partition Online or Offline

There are two partition modes: online and offline.

- **Online** — SCSI hosts control the partition. In this mode, all host application SCSI commands are processed.
- **Offline** — SCSI hosts cannot control the partition. In this mode, library operations can be performed via the local or remote user interface.

Changing the partition mode changes whether or not the specified partition is online or offline to the host application. Changing a partition mode using the library interface may affect your host application. See your host application documentation for more information.

Note: Some maintenance activities require that the entire library be taken offline. To take the library offline, change the mode of all partitions from online to offline.

When you are changing the partition mode, be aware of the following:

- When you access the **Change Partition Mode** screen, you will see only partitions to which you have been given access.
- When changing the partition mode from online to offline, all host application commands in progress at the start of the mode change are completed.

You can change partition modes from the operator panel or the Web client.

Operator Panel

1. Select **Actions > Change Partition Mode**.

   The partitions are displayed, along with their online/offline status.
2. Use the **Up** and **Down** buttons to select a partition.
3. Press **Modify**.
4. Uses the **Up** and **Down** buttons to change the mode.
5. Press **Apply**.

Web Client

1. Select **Operations > Partitions > Change Mode**.

   In the partition table under **Mode**, the **Current** column indicates the current mode of the partition. The **New** column contains an **Online/Offline** button. The button toggles between modes.

   Note: If a partition is in use, the **Online/Offline** button is grayed out.
2. In the partition table, identify the partition that requires a mode change.
3. Click the **Online/Offline** button to toggle to the desired mode.
4. Click **Apply**.

5 Save the library configuration (see Saving the Library Configuration on page 101).

Configuring Cleaning Slots

Cleaning slots are used exclusively to store cleaning cartridges. Configuring one or more cleaning slots enables the library's AutoClean feature for all partitions in the library. When AutoClean is enabled, the library is notified by a tape drive when cleaning is required, and the library automatically cleans the tape drive using a cleaning cartridge.

You can configure cleaning slots during the initial library configuration or at any time in the future as long as there are licensed slots available in the library.

If no licensed slots are available, you must purchase additional slots or modify or delete a partition to free existing slots (see Working With Partitions on page 52). Cleaning slots are not assigned to specific partitions. They are shared by all partitions within a library.

A maximum of four cleaning slots can be configured. Zero cleaning slots are configured by default.

Cleaning slots do not need to be configured if you clean tape drives manually. For more information about manual tape drive cleaning, see Manually Cleaning Tape Drives on page 134. In addition, you do not need to configure cleaning slots if you use host-based cleaning. Cleaning slots are not visible to the host application. To use host-based cleaning, configure zero cleaning slots in the library and set up your host application to manage the cleaning process. See your host application documentation for more information.

Note: If you decrease the number of cleaning slots from what is currently configured, the extra slots become unassigned and available to use as storage slots with new partitions. For information on how to assign available storage slots to a new partition, see Manually Creating Partitions on page 55.

Note: If the library contains zero import/export (I/E) station slots, you will not be able to import or export cleaning cartridges. See Configuring I/E Station Slots on page 63 for more information.

Note: This operation should not be performed concurrently by multiple administrative users logged in from different locations. You can access the screen, but you cannot apply changes while another administrative user is performing the same operation.

Operator Panel

1. Select **Setup > Dedicated Slots > Cleaning**.
2. Press **Modify**.
3. Use the **Up** and **Down** buttons to select a value from zero to 4.
4. Press **Apply**.
5. Press **Exit**.
6. Save the library configuration (see Saving the Library Configuration on page 101).

Web Client

1. Select **Setup > Cleaning Slots**.
2. Under the **New Settings** column, select the number of cleaning slots to configure.
3. Click **Apply**.
4. Save the library configuration (see Saving the Library Configuration on page 101).

Configuring I/E Station Slots

I/E station slots are used to import and export tape cartridges into and out of the library without disrupting normal library operations.

I/E station slots can be configured as either I/E station slots or storage slots. I/E station slots are used to import and export cartridges and are shared by all partitions. Storage slots are used to store data cartridges and cleaning cartridges.

An I/E station that has been configured for storage may contain cleaning slots. These cleaning slots must be deleted before you can reconfigure the storage slots as I/E station slots. You can view the Library Configuration Report to determine how I/E slots are configured. For more information, see Viewing the Library Configuration Report on page 141. For instructions on deleting cleaning slots, see Configuring Cleaning Slots on page 61.

You cannot configure I/E station slots if cartridges are currently loaded in the I/E station(s). Remove all cartridges from the I/E station(s) before attempting the following procedure.

Each I/E station is configured as a complete unit. When configuring an I/E station, all the slots in the I/E station are configured the same way. The Scalar i40 and Scalar i80 are configured with five I/E station slots by default.

On the Scalar i40, you can configure either zero or five I/E station slots. The I/E station is located in the first column of the right magazine. On the Scalar i80, you can configure zero, five, or 10 I/E station slots. If you configure five, the I/E station is located in the first column of the top right magazine. If you configure 10, you will have two I/E stations, located in the first column of the top right magazine and the first column of the bottom right magazine.

You can configure zero I/E station slots. However, configuring zero I/E station slots has the following consequences:

- You cannot import and export data or cleaning cartridges using I/E stations.
- You cannot manually clean tape drives with a cleaning cartridge using the operator panel.

- You will need to bulk load and unload cartridges, disrupting library operations (see Bulk Loading Tape Cartridges on page 121).

Note: Before using the I/E station to load and unload cartridges, you need to unlock the I/E station, which allows you to slide the magazine out just far enough to access the I/E station slots (see Unlocking the I/E Station on page 113).

Operator Panel

1. Select **Setup > Dedicated Slots > I/E**.
2. Press **Modify**.
3. Use the **Up** and **Down** buttons to select a value.
4. Press **Apply**.
5. Press **Exit**.
6. Save the library configuration (see Saving the Library Configuration on page 101).

Web Client

1. Select **Setup > I/E Station Slots**.

   The **I/E Station Configuration** screen appears. The **Current Settings** column lists the number of I/E station slots that are currently configured.
2. Under the **New Settings** column, select the number of I/E station slots to configure.
3. Click **Apply**.
4. Save the library configuration (see Saving the Library Configuration on page 101).

Configuring Tape Drive Parameters

You can configure Fibre Channel tape drive loop ID, topology, and speed using the operator panel or the Web client. On the Web client, you can also view the actual topology and speed, plus the tape drive's world-wide node name (WWNN) and other information about the tape drives.

You cannot configure SAS tape drive settings. A SAS tape drive's SAS address is automatically and uniquely generated based on a unique World Wide Name (WWN) that the drive receives when it is configured. You can view SAS tape drive settings (but not change them) on the Web client.

Note: If the affected partition is online, it will be taken offline before the parameters are set, and brought back online after they are set.

Table 4 Fibre Channel Tape Drive Configurable Settings

Setting	Description
Loop ID	A unique loop ID is selected by default for all FC tape drives installed in the library. For example, the tape drive installed in the top drive bay is assigned a default loop ID of 61. The tape drive installed in the bottom drive bay is assigned a default loop ID of 63. If you change the default loop IDs, make sure each FC tape drive with a topology setting of Auto (LN), Loop (L), or Auto (NL) has a unique loop ID.
Requested Topology*	The requested topology connection mode can be set to one of the following: • Auto (LN) — Auto-configure trying L-Port first • Loop (L) — Force L-Port • Point to Point — Force N-Port • Auto (NL) — Auto-configure trying N-Port first (default)

Setting	Description
Requested Speed*	The requested interface speed can be set to Auto (default), 1 Gb/s, 2 Gb/s, and 4 Gb/s. When you set the speed to 4 Gb/s on the Web client, a caution message appears informing you that the 4 Gb/s speed selection may not be applicable to all FC tape drives installed in the library. Acknowledge the message by clicking **OK**.

* If the requested FC topology and speed settings are not supported, the next appropriate settings are negotiated. On the Web client, the **Setup - Drive Settings** screen displays both the requested and the actual FC topology connection mode and interface speed. If FC drives are not connected to the host, the negotiated actual settings appear on the screen as "unknown."

Operator Panel

1. Select **Setup > Tape Drives (FC)**.
2. Use the **Up** and **Down** buttons to select a tape drive and press **Select**.
3. Use the **Up** and **Down** buttons to select the item to configure (Speed, Topology, or Loop ID) and press **Modify**.
4. Use the **Up** and **Down** buttons to scroll through the list of options until you reach the one you want, then press **Apply**.
5. Continue to modify as above. When finished, press **Exit**.
6. Save the library configuration (see Saving the Library Configuration on page 101).

Web Client

1. Select **Setup > Drive Settings**.
2. View the SAS tape drive settings, if desired.
3. Make changes to any of the Fibre Channel tape drive settings by using the drop-down lists to select new values.
4. Click **Apply**.
5. Save the library configuration (see Saving the Library Configuration on page 101).

Configuring Control Paths

A control path is the connection between a partition and host application. The control path connection is made through a designated tape drive.

When you create a partition, the library automatically assigns the first tape drive in the partition as the control path. You can modify the control path at any time.

Only one tape drive can be selected as the control path per partition. In the event that the tape drive control path connection to the host application fails, you can manually select a different control path tape drive for the partition.

Note: You might need to modify settings in your host application as a result of modifying the control path. See your host application documentation for more information.

You can only configure control paths via the Web client.

Web Client

1. Select **Setup > Control Path**.
2. If more than one partition exists, select a partition and click **Next**.
3. To select a new control path for the partition, select a tape drive from the list of tape drives.
4. To delete the control path for the partition, locate the tape drive that is currently selected as the control path and clear the selection.
5. Click **Apply**.
6. Save the library configuration (see Saving the Library Configuration on page 101).

Adding or Upgrading Licensable Features

You can increase the functionality of your library by purchasing licenses for the following upgrades:

- Capacity on Demand (COD)
- Advanced Reporting

For more information about these features, see Licensable Features on page 11.

A license key can be applied to only one library and is tied to the library's serial number. If the license is not installed when you receive your library, you will receive a *License Key Certificate* that contains an authorization code and instructions on how to obtain your license key from the Quantum Web site. Once you install the license key on the library, the feature becomes available.

Viewing Your License Keys

To see the licenses you have purchased and obtained, go to the following Web site: http://www.quantum.com/licensekeys. The license history for each feature is listed (feature licensed, authorization code, and date license key was obtained).

Viewing Installed Licenses

To see which licenses are enabled on your library, go to the following screens:

Operator Panel

Select either of the following

- **Reports > Licenses**
- **Setup > License Installation**.

Web Client

Select **Setup > License**.

About License Keys

Details about license keys include:

- An authorization code to obtain a license key can be used one time only.
- A license key consists of 5 characters randomly selected from the following allowable characters: a-h, j-n, p-t, v-z, 2-9, and the ampersand character (@). Alpha characters are always lower case.
- A given license key can only be used on the library to which it is assigned and cannot be transferred to another library. The key is verified when it is applied to the library to make sure it is the proper key associated with the library serial number.
- License keys do not expire.

Once installed on the library, license keys cannot be removed (unless you replace the library chassis or system control board (SCB).

- If you replace the library chassis: The license key is associated with the serial number of the library. If you replace your library chassis, you must replace all your installed license keys. Request replacement license keys from Quantum.
- If you replace the SCB: The SCB contains information about your library configuration. If you replace your SCB, you must reinstall your license key(s) onto the library. You may be able to reinstall them yourself if you have saved the license keys or can retrieve them from the Web sites listed above. In some cases, factory installed license keys will not be listed on the Web site and you will need to contact Quantum for a replacement. If you cannot retrieve your license keys or need assistance, contact Quantum.

Obtaining a License Key

To obtain your license key for a new feature or upgrade:

1. Contact your Quantum technical sales representative to submit your order for the feature or upgrade.
2. Upon receipt of your order, Quantum will mail you a license key certificate containing your authorization code.

3 On your library, locate the serial number. You will need the serial number to retrieve your license key from the Web site. To locate the serial number:

   - On the operator panel, select **Reports > About Library**.
   - On the Web client, select **Reports > About > Scalar i40/i80**.

4 Access the license key Web site: http://www.quantum.com/licensekeys.

5 Enter the information requested on the screen to obtain your license key.

You are now ready to apply the license key to the library. See Applying a License Key on page 70.

Applying a License Key

A license key may be applied to the library during the initial configuration or whenever licensed features are purchased.

Caution: While you are installing a license key, backup operations may be interrupted.

Operator Panel

Entering a license key on the operator panel is difficult. It is recommended that you use the Web client, if possible.

1 Select **Setup > License Installation**.

   The screen displays your current licenses.

2 Press **Add**.

   Five blank digits appear on the screen. The first digit is highlighted.

3 Use the **Up** and **Down** buttons to scroll through the list of letters and numbers until the first number appears. Press the **Right** button to advance to the next digit. Repeat for the remaining digits.

4 When all the digits are entered correctly, press **Apply**.

5 Press **OK**.

6 Save the library configuration (see Saving the Library Configuration on page 101).

Web Client

1. From the Web client, select **Setup > License**.
2. Type the new license key in the **Enter new license key** text box.
3. Click **Apply**.
4. Refresh your Internet browser. Adding a license can sometimes affect menu display. Refreshing the browser updates all the menus.
5. Save the library configuration (see Saving the Library Configuration on page 101).

Working With E-mail Notifications

The library can be configured to automatically send e-mail notifications to specified e-mail addresses whenever an issue of a particular severity level occurs with one of its components. The information in the e-mail notification provides details about the issue and the library conditions at the time of the error.

Before you can configure e-mail notifications, you must configure the library's e-mail account so that the library can send notifications to the designated recipients. See Configuring the Library E-Mail Account on page 74 for information on how to configure the e-mail account.

The library supports a maximum of 20 e-mail notification recipients, including the default support e-mail notification. See Creating E-mail Notifications on page 72 for information on setting up additional e-mail notifications.

If an e-mail notification is no longer needed, you can delete it. For information on how to delete an e-mail notification, see Deleting E-mail Notifications on page 74.

There are three e-mail notification filter levels: low, medium, and high.

- Low — Notifies e-mail recipients of all library issues, including minor, medium-level, and critical issues.
- Medium — Notifies e-mail recipients of medium-level and critical issues.
- High — Notifies e-mail recipients of only critical issues.

The library comes with one default e-mail notification recipient, for Quantum Technical Support. The filter level is set at high. The e-mail address of the default technical support notification (**techsup@quantum.com**) cannot be modified, but the notification can be enabled or disabled. It is disabled by default.

Users with administrative privileges can configure the library e-mail account and e-mail notifications. Users with user privileges can receive e-mail notifications, but they cannot configure the library e-mail account or e-mail notifications.

You can view and configure e-mail notifications from the Web client only.

Creating E-mail Notifications

Administrative users can create e-mail notifications. The library supports a maximum of 20 e-mail notification recipients, including the default support e-mail notification. Each e-mail notification recipient must have a unique e-mail address.

To set e-mail notifications, you need to provide the e-mail address and filter level setting for the recipient. For more information on filter levels, see Working With E-mail Notifications on page 71.

Each e-mail notification includes an optional Comments text box you can use to enter important system configuration details, such as the network environment or third-party software applications that interface with the library. Such information can help technical support personnel to troubleshoot the library.

You can create e-mail notifications on the Web client only.

Web Client

1. Select **Setup > Notification > Setup**.

   The **Setup - System E-mail Notifications** screen appears. The screen lists all e-mail notifications that have been created.

2. Click **Create**.

   The **Create System E-mail Notification** screen appears.

3. In the **Select Filter Level** drop-down list, select the filter level to assign to the e-mail notification. For more information on filter levels, see Working With E-mail Notifications on page 71.

4 In the **Enter E-mail Address** text box, type the e-mail address that you want to receive e-mail notifications.

Note: Do not enter more than one e-mail address in the **Enter E-mail Address** text box. If you need to send e-mail notifications to multiple e-mail addresses, create an e-mail notification for each e-mail address.

5 In the **Enter E-mail Comment** text box, type a comment (optional).

6 Click **Apply**.

7 Save the library configuration (see Saving the Library Configuration on page 101).

Modifying E-mail Notifications

Administrative users can modify existing e-mail notification settings at any time after the e-mail notification is created.

Note: The e-mail address of the default technical support notification (**techsup@quantum**) cannot be changed, but the notification can be enabled or disabled.

You can modify e-mail notifications on the Web client only.

Web Client

1 Select **Setup > Notification > Setup**.

The **Setup - System E-mail Notifications** screen appears. The screen lists all the e-mail notifications that have been created.

2 Select an address to modify, and click **Modify**.

The **Modify System E-mail Notification** screen appears.

3 Modify any of the following settings:

- Under the **New Settings** column, select the **Enable** check box to enable e-mail notification. Clear the **Enable** check box to disable e-mail notification.
- Under the **New Settings** column, select a new filter level from the **Filter Level** drop-down list. For more information on filter levels, see Working With E-mail Notifications on page 71.

- In the **E-mail Address** text box, type a new e-mail address.
- In the **E-mail Comment** text box, type a new comment.

4 Click **Apply**.

5 Save the library configuration (see Saving the Library Configuration on page 101).

Deleting E-mail Notifications

Administrative users can delete an e-mail notification when it is no longer needed.

Note: The default **techsup@quantum.com** e-mail notification cannot be deleted, but the notification can be enabled or disabled. It is disabled by default.

You can delete e-mail notifications on the Web client only.

Web Client

1 Select **Setup > Notification > Setup**.

2 Select an e-mail notification and click **Delete**.

A confirmation dialog box appears.

3 Click **OK**.

4 Save the library configuration (see Saving the Library Configuration on page 101).

Configuring the Library E-Mail Account

The library uses the library e-mail account whenever library e-mail services are used, such as when the library automatically sends e-mail notifications about library issues.

Before configuring the e-mail account, ask your network administrator for an IP address, valid login account (optional), and valid password

(optional) for your SMTP server. E-mail account settings are not case-sensitive.

Note: You may use a host name for the SMTP server instead of an IP address only if the library is set up to use Domain Name System (DNS) servers. See Default Gateway, Subnet Mask, Network Prefix, and DNS Addresses on page 45 for more information.

After configuring the e-mail account, you can send a test message to an e-mail address to verify that the account is configured properly.

You must have administrative privileges to configure the e-mail account.

You can configure the library e-mail account from the Web client only.

Web Client

1 Select **Setup > Notification > E-mail Account**.

The **Setup - E-mail Account** screen appears.

2 In the **SMTP server** text box, type the IP address or host name of the SMTP server.

Note: IP addresses may be entered using the IPv4 dot notation or using the IPv6 format. IPv4 addresses must be entered in dot notation (for example, 192.168.0.1). IPv4 address text boxes do not allow values exceeding 255 for dot-separated values.

3 In the **Sender E-mail Address** text box, type an e-mail address for the SMTP server (for example, scalar_i40@mycompany.com). The sender address indicates the originator of the e-mail message.

4 For **Send snapshot with e-mail notifications**, do one of the following:

- To attach a library snapshot file to e-mail notifications, select the check box.
- To not attach a library snapshot file to e-mail notifications, clear the check box.

Note: **Send snapshot with e-mail notifications** instructs the library to automatically attach a library snapshot file (ASCII format) to most e-mail notifications. This feature is turned off by default. Library snapshot files can also be sent to specified e-mail addresses using the capture snapshot operation. The capture snapshot operation allows you to create the snapshot in ASCII format. See Capturing the Library Snapshot on page 247.

5 For **Authentication**, do one of the following:

- If you do not need to configure login account and password authentication settings, clear the **Authentication** check box. Continue with Step 6.
- If you need to configure login account and password authentication settings, select the **Authentication** check box. The **Login Account, Password**, and **Confirm Password** text boxes appear. Do the following:

  a In the Login Account text box, type the name of a valid account on the SMTP server (for example, john.user).

  b In the Password text box, type the password for the account that you specified in the Login Account text box.

  c In the Confirm Password text box, retype the password to confirm it.

6 Click **Apply**.

7 To test the e-mail account, type an e-mail address into the **Send a test e-mail to text box** and click **Send e-mail**. Check the e-mail account to verify that an e-mail message was sent from the library.

8 Save the library configuration (see Saving the Library Configuration on page 101).

Setting Customer Contact Information

Administrative users can enter contact information into the library for the person who is the primary customer contact for the library. Keep this information current to expedite the service process.

When a problem occurs with the library, the contact information is mailed to **techsup@quantum.com** along with diagnostic ticket information, assuming that the default e-mail notification has been configured. For information on configuring the default e-mail notification see Creating E-mail Notifications on page 72.

You can set customer contact information from the Web client only.

Web Client

1. Select **Setup > Notification > Contact Information**.
2. Enter or modify any of the information in the following text boxes:
   - First Name
   - Last Name
   - Company Name
   - Phone Number
   - E-mail Address
   - System Description
3. Click **Apply**.
4. Save the library configuration (see Saving the Library Configuration on page 101).

Configuring the Service Port

There are two Ethernet ports on the SCB. The left port is for customer use for remote access via the Web client, and the right port is for service use only. The default service port IP address is **192.168.177.1**.

You should not need to change the service port subnet unless it happens to conflict with the subnet configured for the customer port. If there is a conflict you must change it to avoid ambiguity between the two interfaces.

The instructions below explain how to change the IP address on the service port. You can only change the subnet (third octet) of the IP address: 192.168.**xxx**.1. The other sections must remain as they are. You may choose a number from 1 to 255.

You can only configure the service network from the operator panel.

Operator Panel

1. Select **Tools > Service Network**.

   Under "Modify Subnet" the first digit of the three-digit octet of the IP address is highlighted.

2. Use the **Left** and **Right** buttons to select a digit to modify. Use the **Up** and **Down** buttons to select a value for the digit. When you press the **Right** button to the third digit, its function changes to **Apply**.

3. When you finish making changes, press the **Right** button until its function changes to **Apply**, then press **Apply**.

4. Press **OK**.

5. Save the library configuration (see Saving the Library Configuration on page 101).

Working With Local User Accounts

Administrative users can create and modify two types of local user accounts: user and administrative user. These users have different library privilege levels and can access different things. The Web client requires user accounts and user logins; the operator panel does not. You can configure the operator panel to run with no logins required. You can also configure the library to use Lightweight Directory Access Protocol (LDAP) accounts.

This section covers:

- Using the Web Client Default Administrative User Account on page 79
- Privilege Levels on page 80
- Creating Local User Accounts on the Web Client on page 81
- Modifying Local User Accounts on the Web Client on page 82
- Deleting Local User Accounts on the Web Client on page 82
- Enabling and Creating Passwords on the Operator Panel on page 83
- Disabling Passwords on the Operator Panel on page 85
- Resetting Passwords on the Operator Panel on page 86

You must have administrative privileges to create, modify, and delete local user accounts.

Using the Web Client Default Administrative User Account

The library ships with a default administrative user account for use on the Web client. The default administrative user account has the following settings:

- User name: **admin**
- Password: **password**.

The first time you access the library via the Web client, when you see the **Login** screen, type **admin** in the **User Name** text box and **password** in the **Password** text box. As soon as you complete the initial library setup, you should change the password on the default administrative account. For information on changing passwords, see Modifying Local User Accounts on the Web Client on page 82.

Note: You cannot delete the default administrative user account or modify the user name. You can, however, change the password.

Note: If you misplace the password for the default administrative account, contact Quantum Technical Support (see Getting More Information or Help on page xxiv).

Privilege Levels

User privilege levels are manually assigned to user accounts created within the library. Controlling access to screens and operations within the library preserves the integrity of the library and the data that is stored in it.

Three types of users are defined in Scalar i40 and Scalar i80 libraries:

- **Administrative users** have access to the entire physical library and all of its partitions. The library ships with a default administrative user account. The user name for the default administrative user account is **admin** and the password is **password**. You cannot modify or delete the user name for the default administrative account, but you can modify the password. If you misplace the password for the default administrative account, contact Quantum Technical Support.

  For security purposes, an administrative user can prevent a service user from logging on to the library remotely, from either the Web client or over the Ethernet service port. The service user will still be able to log on to the library from the operator panel interface. For more information, see Remote Service Login on page 99.

- **Users** have access to portions of the **Actions, Operations,** and **Reports** menus. Users cannot access the **Setup** and **Tools** menus. Users can perform functions within a partition (such as performing cartridge and tape drive operations), but cannot perform operations that affect the physical library (such as creating or deleting partitions).

  - On the Web client, users can only perform operations and view reports within partitions to which they have been granted access.
  - On the operator panel, users can perform actions and view reports for all partitions.

- **Service users** have access to the entire physical library and all of its partitions as well as to service-only functions. Each library has only one service user account. When a service user logs in, all other active users are automatically logged out.

Creating Local User Accounts on the Web Client

During or after the initial configuration, you can use the default administrative user account to create additional local user accounts, including other accounts with administrative privileges. These administrative users can themselves create other local administrative user and user accounts. Users without administrative privileges cannot create user accounts. The library can contain a total of eighteen user accounts, including the default administrative user account.

Web Client

1. Select **Setup > User Management > User Accounts**.
2. Click **Create**.

   The **Create User Account** screen appears.
3. Type a name for the local user account into the **Enter User Name** text box. User names are limited to 1–12 lower-case letters, numbers, and underscores (_). For example: john_usa.
4. Type a password for the local user account into the **Enter Password** text box. Passwords are limited to 6–12 lower-case alphanumeric characters and can include also include underscores (_), periods (.), hyphens (-), asterisks (*), and ampersands (@). For example: pass_19.
5. Retype the password into the **Confirm Password** text box to confirm.
6. Select a local user account privilege level by selecting either Admin or User. For more information on users and administrative users, see Privilege Levels on page 80.
7. If the new local user account was given user privileges, click **Next**. The **Create User Account - User Name** screen appears, where **User Name** is the name of the user account. This screen lists all library partitions. Select the library partitions that you want the user to access.
8. Click **Apply**.
9. Save the library configuration (see Saving the Library Configuration on page 101).

Modifying Local User Accounts on the Web Client

After a local user account has been created, administrative users can modify the account settings, such as the password, privilege level, and partition access. You cannot modify the user name. Instead, you will need to delete the user account and create a new one (see Deleting Local User Accounts on the Web Client on page 82).

Web Client

1. Select **Setup > User Management > User Accounts**.

   The **Setup - Users** screen appears.

2. Select a user account and click **Modify**.

   The **Modify User Account** screen appears, where **User Name** is the name of the local user account.

3. Enter your Admin password to verify you have privileges to modify the account.

4. Modify the password or privilege level, if desired.

5. If the user account has user privileges and you want to modify partition access, click **Next**. The **Modify User Account - User Name** screen appears, where **User Name** is the name of the user account. This screen lists all library partitions, with the user's assigned partitions checked. Modify any of the partition selections.

6. Click **Apply**.

7. Save the library configuration (see Saving the Library Configuration on page 101).

Deleting Local User Accounts on the Web Client

Administrative users can delete other local administrative user and user accounts when they are no longer needed.

Note: You cannot delete the default administrative user account.

Web Client

1. Select **Setup > User Management > User Accounts**.

   The **Setup - Users** screen appears.

2 Select a user account and click **Delete**.

   A confirmation dialog box appears.

3 Click **OK**.

4 Save the library configuration (see Saving the Library Configuration on page 101).

Enabling and Creating Passwords on the Operator Panel

If you do not set passwords on the operator panel, all users will have access to all functions, including administrative and service functions. If you want to restrict access to some users, you must set passwords on the operator panel.

Passwords on the operator panel are disabled by default. Once you enable and configure passwords on the operator panel, all users must enter a password on the operator panel to log in. In addition, the service login is automatically enabled and users with user or admin privileges cannot access service functions. The service password is only available to Quantum Support personnel.

Passwords on the operator panel are completely different and separate from passwords on the Web client. On the Web client, you can create and set up to 18 unique user accounts with different user names, passwords, privileges, and partition access. On the operator panel, only three unique accounts names are allowed, and the user names and privileges cannot be changed (the only thing you can change is the password on the user and admin accounts). The user names are:

User Name	Privilege Level
admin	Administrative
user	User
service	Service — Only service users may use this account. You may not modify the password for this account.

See Privilege Levels on page 80 for a description of administrative and user privileges.

In order to use logins and passwords, you must set the passwords for at least the admin account. You can only do this via the operator panel.

You can enable just the admin password (and NOT the user password). However, you can not enable just the user password.

Operator Panel

You start out by creating the admin account password. Once created, you are logged out and need to log back in using the admin password. Then you can create the User account password.

1. Select **Setup > Account Settings > Password Settings**.

   Admin Password is highlighted.

2. Press **Modify**.

   Disabled is now highlighted.

3. Press the **Up** button to change the setting to **Enabled**.

4. Press **Apply**.

5. You are prompted to create the password. The password is a 4-digit code (no letters or other characters). The first digit of the code is highlighted. Use the **Up** and **Down** buttons to select a number for the first digit, then press **Right** to go to the second digit. As you move off the digit you created, it displays as a # symbol so that only the digit you are working on displays actual numbers. If you need to view or change a digit, press the **Left** button.

6. When you are finished creating the admin password, press **Right** until the **Validate Password** prompt appears. Re-enter the password the same way you created it. When finished, press **Apply**.

   A confirmation screen displays.

7. Press **OK**.

   The library logs the session out and the operator panel displays the login screen, with the User ID of **admin** highlighted.

8. Press **Apply** to go to the password line.

9. Using the directional buttons, enter the admin password you created and press **Apply**.

10. Select **Setup > Account Settings > Password Settings**.

11. Press the **Down** button to highlight **User Password** and press **Modify**.

    Disabled is highlighted.

12 Press the **Up** button to change the setting to **Enabled**.

13 Press **Apply**.

14 Create and validate the user password the same way you created the admin password above.

15 Save the library configuration (see Saving the Library Configuration on page 101).

Disabling Passwords on the Operator Panel

If you no longer want to use passwords on the operator panel, you can disable them. Once you disable the Admin password, the user password is also automatically disabled. You can only do this on the operator panel.

Operator Panel

1 Select **Setup > Account Settings > Password Settings**.

Admin Password is highlighted.

2 Press **Modify** to modify the Admin password.

Enabled is now highlighted.

3 Press the **Down** button to change the setting to **Disabled**.

4 Press **Apply**.

5 Save the library configuration (see Saving the Library Configuration on page 101).

Modifying Passwords on the Operator Panel

Once passwords are created, you can modify them.

Operator Panel

1 Select **Setup > Account Settings > Modify Password**.

2 Use the **Up** and **Down** buttons to select **admin** or **user**.

3 Press **Apply**.

4 Enter the current password and press **Apply**.

5 Enter a new password and press **Apply**.

6 Re-enter the new password to validate it and press **Apply**.

7 Save the library configuration (see Saving the Library Configuration on page 101).

Resetting Passwords on the Operator Panel

If you forget your operator panel passwords and cannot log in, you must reset the passwords. Resetting the passwords disables them and deletes both the admin and user passwords. This means that no login is required to access the operator panel. You can re-create the passwords again as needed.

You can only reset operator panel passwords via the Web client.

Web Client

1 Select **Setup > User Management > Reset LUI Passwords**.

2 Click **Apply**.

Working With LDAP User Accounts (Remote Authentication)

Local Authentication vs. Remote Authentication

Local authentication control is managed on the library. An administrator sets up accounts and privileges on the library. To use local authentication, a user must enter a local user name and password.

Remote authentication is managed by a Lightweight Directory Access Protocol (LDAP) server. Enabling LDAP allows existing user accounts residing on an LDAP server to be integrated into the library's current user account management subsystem. User account information is centralized and shared by different applications, simplifying user account management tasks.

To use remote authentication, you must enable LDAP on the library. Once LDAP is enabled, users can log into the library using either LDAP or local authentication. To use LDAP authentication, a user must enter a

directory service user name and password and specify an LDAP domain. See Logging In When LDAP or Kerberos is Enabled on page 105.

LDAP logins are only available on the library Web client.

Using Microsoft Active Directory

The library supports the Microsoft® Active Directory® LDAP server. If you use Microsoft Active Directory, you must use either:

- Windows® Services for Unix® 2.5
- Kerberos

If you use Kerberos, you don't need to use Windows Services for Unix 2.5. For specific instructions on configuring Kerberos, see Configuring Kerberos on page 90.

If you use Windows Services for Unix 2.5:

- When setting up a user account in Microsoft Active Directory, make sure to populate the UNIX attributes with information. This requires all Active Directory users to be part of an NIS Domain, or have NIS Domain information entered. After entering NIS Domain information for a user, you will need to reset the user's password.
- The library supports user account information in the schema defined by RFC 2307. User password schemes must be encrypted using UNIX crypt. In addition, user names (uid) and passwords (userPassword) must be created using lowercase characters to be compatible with the library.

LDAP Server Guidelines

For LDAP users with user privileges, access to library partitions is determined by group assignment on the LDAP server. Groups must be created on the LDAP server with names that correspond to the library partition names. Users with user privileges must be assigned to these groups on the LDAP server to have access to the corresponding partitions on the library. LDAP users with administrative privileges have access to all partitions and administrative functions and do not need to be assigned to partition-related groups on the LDAP server.

The Web client Login screen displays LDAP login options only when LDAP is enabled.

Enabling and Configuring LDAP on the Library

Administrative users can enable and configure Lightweight Directory Access Protocol (LDAP). LDAP is the industry standard Internet protocol that provides centralized user account management.

Administrative users can add, delete, and modify only local user account information. The library Web client does not allow you to create, modify, or delete user account information on an LDAP server. This must be done by the directory service provider. For more information on working with local user accounts, see Working With Local User Accounts on page 78.

You can configure the Lightweight Directory Access Protocol (LDAP) settings any time after the initial library configuration. If you want to configure Kerberos, follow the LDAP configuration steps below, and also see Configuring Kerberos on page 90.

Before configuring LDAP, obtain the following LDAP parameters from your network administrator. The items marked "optional" may or may not be needed; if in doubt, ask your administrator.

- Repository URI — The Uniform Resource Identifier (URI) of the LDAP server where user account information is stored. The URI includes the LDAP server host name or IP address and can include the LDAP server network port. Port 389 is the default.
- Group DN (optional) — A group distinguished name (DN) made up of one or more parameters.
- User DN (optional) — A user DN made up of one or more parameters.
- Default domain — Domain that is populated on the login screen by default.
- Principle authorization — Login used to gain access to the directory service.
- Credential authorization — Password for the principal authentication login.
- Library user group — Name of the group you want to associate with the library. This group is equivalent to the local user privilege level (see Privilege Levels on page 80). Any member of this group can manage this library.
- Admin group — Name of the group associated with the library administrator, equivalent to the local administrative user privilege

level. Any member of this group has administrative privileges (see Privilege Levels on page 80).

You can view, enable, and configure LDAP settings from the Web client only.

Web Client

1. Select **Setup > User Management > Remote Authentication**.

   The Setup - Remote Authentication screen appears.

2. Under Authentication Type, do one of the following:
   - To enable LDAP, select **LDAP** and continue with Step 3.
   - To disable LDAP, select **Local Only** and continue with Step 4.
   - To modify LDAP configuration settings, continue with Step 3.
3. Enter LDAP configuration settings into the following text boxes:
   - **Repository URI**
   - **Group DN**
   - **User DN**
   - **Default Domain**
   - **Principal**
   - **Credential**
   - **Confirm Credential**
   - **Library User Group**
   - **Admin Group**
4. Click **Apply** to apply any changes.
5. If you enabled LDAP or modified LDAP settings, click the **Test LDAP** button to test all the new or changed LDAP settings.

   Note: The **Test** button tests communication between the library and the LDAP server. If you changed the LDAP settings, click **Apply** before using this button.

6. Save the library configuration (see Saving the Library Configuration on page 101).

Configuring Kerberos

Use Kerberos if you want to use Microsoft Active Directory without Windows Services for Unix 2.5.

Make sure that both the library and the Kerberos server are set to the same time (within 5 minutes). Otherwise, the authentication will fail. It is recommended that you use Network Time Protocol (NTP) to synchronize the time between the library and the Kerberos server. See Setting the Date and Time Using the Network Time Protocol on page 50.

You can configure the Kerberos® settings any time after the initial library configuration. Before you can configure Kerberos, you need to generate the service keytab file on your Kerberos (AD) server. For instructions, see Generating the Kerberos Service Keytab File on page 91.

You must have administrative privileges to configure Kerberos.

You can only configure Kerberos on the Web client.

Web Client

1. Select **Setup > User Management > Remote Authentication**.

   The Setup - Remote Authentication screen appears.

2. Under **Authentication Type**, do one of the following:

   - To enable Kerberos, select Kerberos (Active Directory®): and continue with Step 3.
   - To disable Kerberos, select LDAP or Local Only and continue with Step 6.
   - To modify Kerberos configuration settings, continue with Step 3.

3. Type the Kerberos settings into the following Kerberos fields:

   - **Realm** — The Kerberos realm name, typed in all uppercase letters. Usually the realm name is the DNS domain name.
   - **KDC (AD Server)** — The server on which Kerberos is installed.
   - **Domain Mapping** — The domain portion of the library's fully qualified domain name.

4. Upload the service keytab file. This is a file you generate on your Kerberos (AD) server. If you have not already generated this file, do

so now. For instructions, see Generating the Kerberos Service Keytab File on page 91. Then click the **Browse** button to upload the file.

5 Configure the LDAP settings as described in Enabling and Configuring LDAP on the Library on page 88.

6 Click **Apply** to apply any changes.

7 If you enabled LDAP or Kerberos, or modified LDAP or Kerberos settings, click the **Test LDAP** button to test all the new or changed LDAP settings.

Note: The **Test** button tests communication between the library and the LDAP server. If you changed the LDAP settings, click **Apply** before using this button.

8 Save the library configuration (see Saving the Library Configuration on page 101).

Generating the Kerberos Service Keytab File

1 Set up an Active Directory domain on the Windows 2003 server.

2 At the command prompt, enter **dcpromo**.

3 **Windows 2003 servers only:** Install Windows Support Tools on the Windows 2003 server as follows:

   a Go to www.microsoft.com and search for "windows server 2003 support tools sp2" or click on the following link:

   http://www.microsoft.com/downloads/details.aspx?FamilyID=96a35011-fd83-419d-939b-9a772ea2df90&DisplayLang=en

   b Download both **support.cab** and **suptools.msi**.

   c Run **suptools.msi** to begin installation.

4 Create a computer account in Active Directory.

   - Do not select any of the check boxes during creation.
   - The account name will be used for <computer account> fields shown in the following steps.

5 At the command prompt, map SPN to the computer account. Use the following format:

```
setspn -A library/<fqdn of library> <computer
account>
```

For example:

```
setspn -A library/delos.dvt.mycompany.com
kerbtest
```

6 At the command prompt, create the keytab file for the SPN. Use one of the following formats:

- **For Windows 2003:**

```
ktpass -out library.keytab -princ

library/<fqdn of library>@<realm>

+rndPass -ptype KRB5_NT_SRV_HST -crypto RC4-
HMAC-NT -mapUser <realm>/computers/<computer
account>
```

For example:

```
ktpass -out library.keytab -princ library/
delos.dvt.mycompany.com@OURREALM.LOCAL

+rndPass -ptype KRB5_NT_SRV_HST -crypto RC4-
HMAC-NT -mapUser ourrealm.local/computers/
kerbtest
```

- **For Windows 2008:**

```
ktpass -out library.keytab -princ library/

<fqdn of library>@<realm>

+rndPass -ptype KRB5_NT_SRV_HST -crypto
AES256-SHA1

-mapUser <realm>/computers/<computer account>
```

For example:

```
ktpass -out library.keytab -princ library/
delos.dvt.mycompany.com@OURREALM.LOCAL

+rndPass -ptype KRB5_NT_SRV_HST -crypto
AES256-SHA1

-mapUser ourrealm.local/computers/kerbtest
```

Setting the Session Timeout

The library automatically logs out a user or administrative user when the library has detected no activity for a specified length of time. This always occurs on the Web client, and will occur on the operator panel if passwords are enabled (see Enabling and Creating Passwords on the Operator Panel on page 83). The default session timeout is 15 minutes. You can change that to 30, 45, or 60 minutes. You can only change this setting on the operator panel.

Operator Panel

1. Select **Setup** > **Account Settings** > **Session Timeout**.

   The current timeout setting is highlighted.
2. Use the **Up** and **Down** buttons to select the desired timeout.
3. Press **Apply**.
4. Save the library configuration (see Saving the Library Configuration on page 101).

Configuring System Settings

You can enable/disable the following system settings on the operator panel:

- Unload Assist
- Logical Serial Number Addressing
- Manual Cartridge Assignment
- SNMP
- SMI-S

Unload Assist

When Unload Assist is enabled, the library will unload tape drives when a move command from the tape drive is received. When Unload Assist is disabled, the tape drive must be unloaded prior to a move command, or the move command will fail. This setting is enabled by default.

Operator Panel

1. Select **Setup > System Settings > Unload Assist**.
2. Press **Modify**.
3. Scroll to select Enabled or Disabled and press **Apply**.
4. Make another selection or press **Exit**.
5. Save the library configuration (see Saving the Library Configuration on page 101).

Logical Serial Number Addressing

The library uses the actual tape drive serial numbers by default (logical SN addressing is disabled). Enabling logical SN addressing enables the library to assign logical serial numbers to all tape drives in the library. Specifically, the library assigns a logical serial number to a tape drive in a specific location, not the serial number of the particular tape drive. If the tape drive is then replaced by another tape drive in the same library location, the logical serial number remains the same. From the host application's perspective, the replacement tape drive is the same as the original. This setting is disabled by default.

Caution: If you change the logical serial number addressing setting, you must power cycle the library (perform a shutdown and press the power button) or remove each tape drive from the library in order for the change to take effect.

Operator Panel

1. Select **Setup > System Settings > Logical SN Addr**.
2. Press **Modify**.
3. Scroll to select Enabled or Disabled and press **Apply**.

4 Make another selection or press **Exit**.

5 Save the library configuration (see Saving the Library Configuration on page 101).

Manual Cartridge Assignment

When manual cartridge assignment is enabled (the default setting), the **I/E Assign** screen automatically appears on the operator panel once cartridges are placed into the I/E station. The **I/E Assign** screen prompts you to assign the cartridges to a specific partition or to the system partition. The cartridges can then be used only by the assigned partition.

When manual cartridge assignment is disabled, the **I/E Assign** screen does not appear on the operator panel, and the cartridges in the I/E station are visible to all partitions, as well as the system partition, and can be used by any partition.

The manual cartridge setting is enabled by default. You can only change this setting on the operator panel.

Understanding Host Application Notification

When manual cartridge assignment is enabled, SCSI Unit Attention 6/2801 notifies the host application when the I/E station has been accessed, allowing the host to automatically detect the presence of media in the I/E station and update its I/E station status information.

When manual cartridge assignment is disabled, host notification via SCSI Unit Attention 6/2801 depends on the number of configured partitions:

If multiple partitions are defined, the host application is not notified when the I/E station has been accessed. Media presence in the I/E station is reported to any partition requesting it.

If a single partition is defined, the host application is notified when the I/E station has been accessed. Media presence is reported to the sole defined partition, as well as to the system partition, when either of these partitions checks for changes in the status of the I/E station.

For information about using the host to perform tape operations, see your host application documentation.

Operator Panel

1. Select **Setup > System Settings > Man Cart Assign**.
2. Press **Modify**.
3. Scroll to select **Enabled** or **Disabled** and press **Apply**.
4. Make another selection or press **Exit**.
5. Save the library configuration (see Saving the Library Configuration on page 101).

SNMP

Enables or disables SNMP traffic to the library. This setting is enabled by default.

Operator Panel

1. Select **Setup > System Settings >SNMP**.
2. Select the setting you want to modify and press **Modify**.
3. Scroll to select Enabled or Disabled and press **Apply**.
4. When finished making all changes, press **Exit**.
5. Save the library configuration (see Saving the Library Configuration on page 101).

SMI-S

Allows you to enable or disable SMI-S running on the library. This setting is disabled by default.

Operator Panel

1. Select **Setup > System Settings > SMI-S**.
2. Press **Modify**.
3. Scroll to select Enabled or Disabled and press **Apply**.
4. Make another selection or press **Exit**.
5. Save the library configuration (see Saving the Library Configuration on page 101).

Configuring Security Settings

You can enable/disable the following security settings on the operator panel:

- Network Interface
- SSH Services
- Internet Control Message Protocol (ICMP)
- Remote Access Via Web Client
- Remote Service Login
- SSL

Network Interface

Enables or disables all external access to the library. This setting is enabled by default to allow external access.

Operator Panel

1. Select **Setup > Security Services > Network IF**.
2. Press **Modify**.
3. Scroll to select Enabled or Disabled and press **Apply**.
4. Make another selection or press **Exit**.
5. Save the library configuration (see Saving the Library Configuration on page 101).

SSH Services

Enables or disables Secure Shell (SSH) services, such as SSH, from accessing the library. This setting is enabled by default.

Operator Panel

1. Select **Setup > Security Services > SSH Services**.
2. Press **Modify**.

3 Scroll to select Enabled or Disabled and press **Apply**.

4 Make another selection or press **Exit**.

5 Save the library configuration (see Saving the Library Configuration on page 101).

Internet Control Message Protocol (ICMP)

Enables or disables external attempts to discover the library by pinging it (by means of the ICMP Echo packets. This setting is enabled by default.

You may disable this feature if you are using IPv4, but you should NOT do so if you are using IPv6. Disabling this feature disables all IPv6 communication on the Scalar i40 and Scalar i80. There will be no error messages, and the library will appear to be working, but it will not be communicating.

Caution: Do NOT disable ICMP if you are using IPv6!

Operator Panel

1 Select **Setup > Security Services > ICMP**.

2 Press **Modify**.

3 Scroll to select Enabled or Disabled and press **Apply**.

4 Make another selection or press **Exit**.

5 Save the library configuration (see Saving the Library Configuration on page 101).

Remote Access Via Web Client

Enables or disables remote access to the library via the Web client. This setting is enabled by default (meaning remote access is allowed).

Operator Panel

1 Select **Setup > Security Services > Web client**.

2 Press **Modify**.

3 Scroll to select Enabled or Disabled and press **Apply**.

4 Make another selection or press **Exit**.

5 Save the library configuration (see Saving the Library Configuration on page 101).

Remote Service Login

Enables or disables remote service user login (from the Web client or over the Ethernet service port). The service user will still be able to log in to the library from the operator panel. This setting is enabled by default (meaning remote service login is allowed).

Operator Panel

1 Select **Setup > Security Services > Service User**

2 Press **Modify**.

3 Scroll to select Enabled or Disabled and press **Apply**.

4 Make another selection or press **Exit**.

5 Save the library configuration (see Saving the Library Configuration on page 101).

SSL

Allows you to enable Secure Socket Layer (SSL) for secure data transmission between the library and remote clients. This setting is disabled by default.

Enabling SSL settings encrypts all Web browser connections to the Web client, and it enables SSL-based authentication for SMI-S. SMI-S is the newest standard of SNMP, which makes sets of data continuously available. For more information about SMI-S on the library, see SMI-S on page 96.

Disabling SSL settings creates an unencrypted connection from a Web browser to the Web client.

See the *Quantum Intelligent Libraries SMI-S Reference Guide* (6-01317-xx) for further configuration and access details.

Note: Before enabling SSL settings, make sure you enter a name for the library in the **Library Name** text box when configuring network settings (**Setup > Network Management > Network** on the Web client; see Library Host Name on page 43). After enabling SSL settings, use that library name to access the library. If you do not use that name, you will receive a security alert. In addition, make sure to complete all the text boxes listed on the Web client Contact Information screen (**Setup > Notification > Contact Information**) before enabling SSL settings. This information is used to identify company information in the SSL certificate.

Operator Panel

1. Select **Setup > Security Services > SSL**.
2. Press **Modify** to change the setting.
3. Save the library configuration (see Saving the Library Configuration on page 101).

Saving and Restoring the Library Configuration

The library has many configurable items, such as tape drive IDs, partitions, user accounts, import/export (I/E) stations, and cleaning slots. In the event of a hardware failure or firmware upgrade, the save and restore operations can be used to restore the library's configurable items to a previous state. The save/restore operation also saves and restores library firmware and license keys installed on the library.

Note: The save/restore operations should not be performed concurrently by multiple administrative users logged in from different locations. You can access the screens, but you cannot apply changes while another administrative user is performing the same operation.

Saving the Library Configuration

It is recommended that you save the library configuration after modifying a configurable item and before upgrading firmware. This allows you to restore the most current settings if necessary.

This operation saves your current library configuration and library firmware.

Save your library configuration when it is in a known working state. In the event of a hardware failure, the saved configuration can be used to restore the configuration after hardware repairs are made.

Before initiating a firmware upgrade, you should save the library configuration. You then have the option to restore the configuration after either a successful or an unsuccessful upgrade.

You can only save the configuration from the Web client.

Web Client

1. Select **Tools > Save/Restore Configuration**.
2. Select **Save System Configuration**.
3. Click **Apply**.
4. When the operation completes successfully, complete the next screens to save the file to a known location.

Restoring the Library Configuration

You can restore the library's configurable items to a previous state using a saved configuration file. If you updated the library firmware since last saving the configuration, the library automatically restores the library firmware to the version that was saved with the configuration.

You can also downgrade library firmware to an earlier version using the **Tools > Update Library Firmware** command. Note that you will lose all your current library configuration information except for network settings, date and time, and license keys. You can restore the other configurable items using a configuration file that was saved when the earlier version of library firmware was installed on the library, or you can reconfigure your library's settings.

You can only restore the library configuration via the Web client.

Web Client

1. Select **Tools > Save/Restore Configuration**.
2. Select **Restore System Configuration**.
3. Click **Apply**.
4. Use the next screens to browse to the saved configuration file and upload it to the library.

This operation saves your current library configuration and library firmware.

Registering the Library

Registering the library activates the warranty. After completing the initial setup of the library, choose **Setup > Register Library** on the Web client to access the online product registration form.

You cannot register the library from the operator panel.

Web Client

Select **Setup > Register Library**.

Chapter 5
Performing Library Operations

This chapter explains how to access and operate your library. Most of the library functions described here can be found on the **Operations** menu of the Web client, or the **Actions** menu of the operator panel.

This chapter covers:

- Logging In
- Logging Out
- Shutting Down, Restarting, Turning Off, and Removing Power
- Emergency Power-off Procedure
- Unlocking the I/E Station
- Releasing Magazines
- Performing Media Operations
- Cleaning Tape Drives
- Taking a Tape Drive Online or Offline

Logging In

All users, service users, and administrative users must log in to the library to perform library functions or view library operations. (Exception: If passwords are not configured on the operator panel, login to the operator panel is not needed.)

Simultaneous Logins

Multiple users can be logged in to the library at the same time. The same user can be logged from multiple locations. Note that multiple users logged in from different locations cannot make changes to configuration settings or perform certain library functions simultaneously. The screens are visible, but access is denied. Whichever one is logged in first has access to the screen until they exit the screens.

Logging In for the First Time

When you first boot up the library, the operator panel does not require you to log in. In fact, if you do not configure passwords for the operator panel, you never need to log in (see Enabling and Creating Passwords on the Operator Panel on page 83 for more information).

If you are logging in to the Web client for the first time, use the default user name and password:

- Default user name: **admin**
- Default password: **password**

After you log in for the first time, change the password for the default admin account. See Modifying Local User Accounts on the Web Client on page 82.

Note: If you misplace the password for the default admin account, contact Quantum Technical Support. For contact information, see Getting More Information or Help on page xxiv.

Logging In Using the Operator Panel

If passwords have not been set on the operator panel, you do not need to log in, and all operations are allowed to all users. It is recommended

that you set passwords on the operator panel (see Enabling and Creating Passwords on the Operator Panel on page 83).

If passwords have been set on the operator panel, there are three possible user IDs, admin, user, and service. Login as follows:

1. At the login screen, use the **Up** and **Down** buttons to select **admin, user**, or **service**.
2. Press **Apply**.
3. Enter the first digit of the password using the **Up** and **Down** buttons to scroll to the correct number, then press **Right** to go to the next digit. Configure the rest of the digits in the same way.

   Note: Only the digit you are currently modifying displays an actual number. When you finish one digit and move to the next, the completed digit displays as a cross-hatch symbol (#).

4. When finished entering all digits, press **Apply**.

Note: If you misplace the password for the operator panel logins, you can clear operator panel passwords via the Web client (see Resetting Passwords on the Operator Panel on page 86).

Logging In Via the Web Client

1. Establish an Internet connection to the library by typing the library's IP address into your Internet browser.

   If you do not know your library's IP address, you can find it on the operator panel by selecting **Reports > Network Settings**.

2. At the login screen, enter a user name and its associated password and click **OK**.

Logging In When LDAP or Kerberos is Enabled

When LDAP or Kerberos is enabled, the **Login** screen displays the following items in addition to the User Name and Password text boxes:

Use Local Authentication — Select this option to log in using a local user name and password.

Use LDAP Authentication — Select this option to select or enter a domain and log in using a directory service user name and password.

For more information on LDAP, see Enabling and Configuring LDAP on the Library on page 88.

For more information on Kerberos, see Configuring Kerberos on page 90.

Logging Out

Logging out secures the library from being accessed by unauthorized users. Log out whenever you have finished accessing the library.

You will only be able to log out of the operator panel if passwords have been configured (see Enabling and Creating Passwords on the Operator Panel on page 83).

Note: Clicking the close button (**X**) in the upper-right corner of the Web client closes the browser window but does not log you out.

Note: All users are logged out automatically after a configurable period of inactivity. The default timeout period is 15 minutes, but you can change this (see Setting the Session Timeout on page 93).

Operator Panel

1. Select **Actions > Logout**.
2. Press **Yes** to confirm.

Web Client

1. Click the

Logout button in the upper right corner of the screen, or select **Operations > Log Out**.
2. Click **OK** to confirm.

Shutting Down, Restarting, Turning Off, and Removing Power

It is important to shut down the library properly before turning off the library or completely removing library power.

Caution: You should always perform a shutdown before turning off the library or completely removing power. Otherwise, the following could occur:
- The library may not complete closing all data and log files.
- If you turn off power or unplug the power cord while writing to tape, the data on the tape could become corrupted.
- If you unplug the power cord, the robot may become frozen in the middle of an operation and unable to move once library power is restored, possibly requiring a service call.

The steps for shutting down, turning off, and completely removing library power are:

1. Make sure the connected host applications are not sending commands to the library and that all library operations have stopped.
2. Shut down the library using the operator panel or Web client (see Shutting Down the Library on page 107).
3. Turn **OFF** the library by pressing the power button on the front panel (see Turning Off the Library on page 111).
4. Remove library power by disconnecting the power supply cord from the power supply on the back of the library. If there are two power supplies, remove the cords to both. See Completely Removing Library Power on page 111.

Shutting Down the Library

Shutdown shuts down the library's operating system and firmware, closes data and log files, and retracts the picker so that a tape cartridge or the picker fingers are not stuck part way into a tape drive or

magazine slot. If the robot was in the middle of a get or put operation, it will attempt to complete the operation before shutting down, by either pushing the cartridge into the destination slot, or removing it completely from the slot and stopping in a safe location from which it can move again once power is restored.

Once the shutdown is complete, you can safely turn off the library by pressing the power button on the front panel (see Turning Off the Library on page 111).

Operator Panel

1. Make sure the connected host applications are not sending commands to the library and that all library operations have stopped.
2. Press **Actions > Shutdown > Shutdown Library**.
3. Press **Yes** to confirm.

   A "shutdown in progress" message appears on the operator panel (see Figure 22).

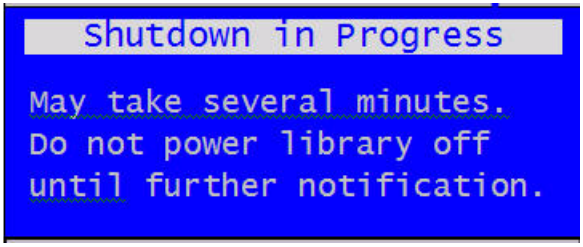


Figure 22 Shutdown in Progress Message

4. Wait until the "ready to power down" message appears (see Figure 23).

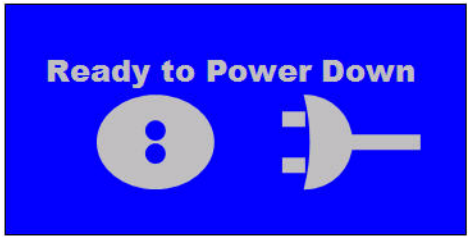


Figure 23 Ready to Power Down Message

5 Turn **OFF** the library by pressing the power button on the front panel.

Web Client

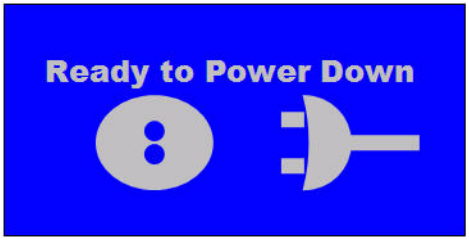
1 Press **Operations > System Shutdown**.

2 Select **Shutdown** and click **Apply**.

3 Click **OK** to confirm.

4 Wait until the "ready to power down" message appears on the operator panel (see Figure 24).

Figure 24 Ready to Power Down Message



5 Turn **OFF** the library by pressing the power button on the front panel.

Restarting the Library

Restart shuts down and then reboots the library's operating system and firmware. During the reboot, the library performs an inventory of the tape drives and magazine slots. The reboot takes approximately 5 minutes.

Operator Panel

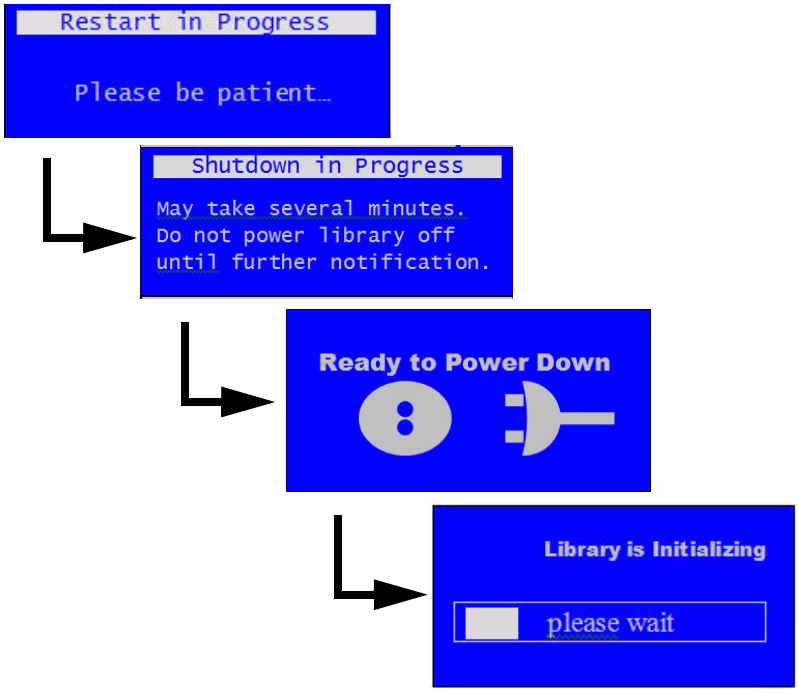
1 Make sure the connected host applications are not sending commands to the library and that all library operations have stopped.

2 Press **Actions > Shutdown > Restart Library**.

3 Press **Yes** to confirm.

4 Several messages appear on the screen, in the order shown in Figure 25. Do not do anything in response to these messages. The library will restart and initialize on its own.

Figure 25 Series of Restart Messages



Web Client

1 Make sure the connected host applications are not sending commands to the library and that all library operations have stopped.

2 Press **Operations > System Shutdown**.

3 Select **Restart** and click **Apply**.

4 Press **OK** to confirm.

5 Several messages appear on the operator, in the order shown in Figure 25 on page 110. Do not do anything in response to these messages. The library will restart and initialize on its own.

Turning Off the Library

Turning **OFF** the library means pressing the power button on the front panel.

It is recommended that you perform a shutdown via the Web client or operator panel before turning off the library. If you do not perform a shutdown, the library attempts to complete all shutdown operations before turning off the library. However, it may not have enough time to shut down completely, and operations could be stopped mid-process.

Caution: You should always perform a shutdown before turning off the library or completely removing power. Otherwise, the following could occur:
- The library may not complete closing all data and log files.
- If you turn off power while writing to tape, the data on the tape could become corrupted.

1. Make sure the connected host applications are not sending commands to the library and that all library operations have stopped.
2. Shut down the library (see Shutting Down the Library on page 107).
3. Turn **OFF** the library by physically pressing the power button on the library's front panel. It can take up to 12 seconds for the power to completely turn off.

Note: Turning off the library does not completely remove library power (see Completely Removing Library Power on page 111).

Completely Removing Library Power

Completely removing library power means disconnecting the power cord from each power supply on the library.

Caution: You should always perform a shutdown and then turn off library power before completely removing power. Otherwise, the following could occur:
- The library may not complete closing all data and log files.
- If you turn off power or unplug the power cord while writing to tape, the data on the tape could become corrupted.
- The robot may become frozen in the middle of an operation and unable to move once library power is restored, possibly requiring a service call.

1. Make sure the connected host applications are not sending commands to the library and that all library operations have stopped.
2. Shut down the library (see Shutting Down the Library on page 107).
3. Turn **OFF** the library by physically pressing the power button on the library's front panel (see Turning Off the Library on page 111). Make sure the operator panel turns off or the LED on the SCB turns off.
4. Disconnect the power cord(s) from all power supplies on the back of the library. If there are two power supplies, disconnect both cords. Power is completely removed from the library when the LED on each power supply is off.

Emergency Power-off Procedure

In an emergency, you may need to turn off power immediately to stop robot motion, bypassing the normal shutdown process.

In an emergency, you can turn off power in one of two ways:

- Press the power button on the front of the library to turn the library **OFF**. It may take up to 4 seconds for all motion to completely stop. Note that this does not completely remove library power (you need to disconnect the power cords to do that).
- Disconnect the power cord from each power supply on the back of the library. It may take 1 to 2 seconds for motion to completely stop.

Caution: These methods are not recommended except in case of emergency where it is vital that library operations be stopped immediately. If you do not first perform a shutdown as described in the sections above, the following could occur:

- The library may not complete closing all data and log files.
- If you turn off power or unplug the power cord while writing to tape, the data on the tape could become corrupted.
- If you unplug the power cord, the robot may become frozen in the middle of an operation and unable to move once library power is restored, possibly requiring a service call.

Taking the Library Offline

Some maintenance activities require that the entire library be taken offline. To take the library offline, change the mode of all partitions from online to offline. See Taking a Partition Online or Offline on page 59 for instructions.

Unlocking the I/E Station

The I/E station is locked during normal library operation. To access the I/E station you must first unlock it. Once unlocked, you have 30 seconds to open the I/E station before it locks again.

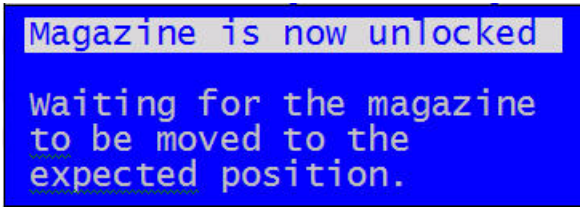
Note: If you want to open more than one I/E station, such as when importing multiple tape cartridges, unlock and open both I/E stations before you close either of them. Otherwise, if you open and close one at a time, you must wait for the robot to complete inventory on the one being closed before it can open the other one.

Operator Panel

1. Select **Actions > I/E > Unlock I/E Station**.
2. Select which I/E station to unlock, and press **Unlock**.
3. Wait until the screen displays the "magazine is now unlocked" message (see Figure 26 on page 114), then pull outward on the magazine bezel handle to open the I/E station.

   If you do not open the magazine within 30 seconds, it locks and you receive a diagnostic ticket.

Figure 26 Magazine Unlocked Message



Web Client

1. Select **Operations > I/E Station Unlock**.
2. Select the I/E station to unlock and click **Apply**.
3. Click **OK** to confirm.
4. Wait until the Web client displays the Success message, then pull outward on the magazine bezel handle to open the I/E station.

   If you do not open the magazine within 30 seconds, it locks and you receive a diagnostic ticket.

Releasing Magazines

Magazines are locked during normal operation. Before you open or completely remove a magazine, you must release it, either via the user interface or manually.

Note: If you want to remove more than one magazine, such as when bulk loading tape cartridges, release and remove all the magazines you want to remove before you close any of them. Otherwise, if you remove and replace them one at a time, you must wait for the robot to complete inventory on the one being replaced before it can release another one.

Caution: If the library is turned **ON**, always release the magazines via the user interface. It is easier and will not result in a diagnostic ticket (see About Diagnostic Tickets on page 244). Additionally, the library makes sure nothing is physically blocking the magazine that could cause damage to library components before allowing you to release it.

Releasing Magazines via the User Interface

Use this method when the library is turned **ON**.

Operator Panel

1. Select **Actions > Magazine**.
2. Select a magazine and press **Release**.
3. Wait until the screen displays the "magazine is now unlocked" message (see Figure 27), then pull outward on the magazine bezel handle to slide the magazine out as far as you wish, or remove it completely. Once you slide the magazine back into the slot all the way, it locks again automatically

   If you do not open the magazine within 30 seconds, it locks and you receive a diagnostic ticket.

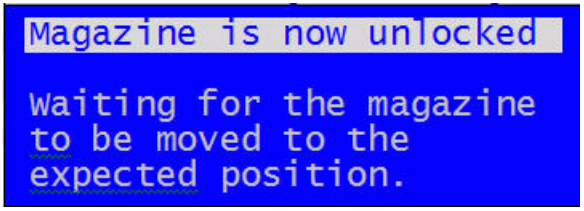


Figure 27 Magazine Unlocked Message

Web Client

1. Select **Operations > Release Magazine**.
2. Select a magazine and press **Release**.
3. Click **OK** to confirm.
4. Wait until the Web client displays the **Success** message, then pull outward on the magazine bezel handle to slide the magazine out as far as you wish, or remove it completely. Once you slide the magazine back into the slot all the way, it locks again automatically.

   If you do not open the magazine within 30 seconds, it locks and you receive a diagnostic ticket.

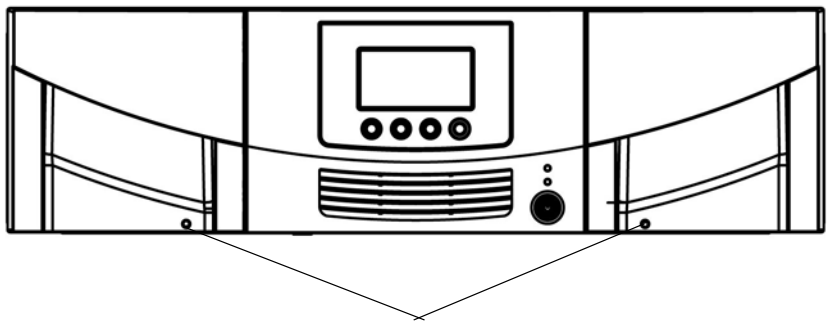
Releasing Magazines Manually

Use this method when the library is turned **OFF**. If you use this method when the library is turned **ON**, you will receive a diagnostic ticket.

Caution: If you use the manual method to remove magazine(s) when the library is turned **ON** you risk a mechanical collision between the magazine and the robotics that could seriously damage components.

1. Insert an opened paperclip, small screwdriver, or other object (3.5 mm or less in diameter that will not break off) into the access hole in the bottom of the magazine bezel (see Figure 28).
2. Use the tool to depress the release latch while gently pulling the magazine bezel handle to slide the magazine out.
3. If the magazine is on the right side, it will only slide out as far as the I/E station. To release the magazine fully:
   - On the Scalar i40 and the bottom right magazine of the Scalar i80, reach under the open magazine and insert the tool directly into the access hole in the library chassis to depress the release latch, while pulling out on the magazine bezel handle.
   - On the top right magazine of the Scalar i80, reach under the open magazine and press the release latch directly with your finger, while pulling out on the magazine bezel handle.

Figure 28 Magazine Release Latch Access



Performing Media Operations

This section describes how to import, export, load, unload, and move data cartridges in the library. The following section, Cleaning Tape Drives on page 128, describes how to perform similar operations with cleaning cartridges.

Note: The information and procedures in this user's guide apply specifically to the library Web client and the operator panel user interface, not to the host application. Performing media operations through the library user interface may affect your host application. See your host application documentation for information.

Importing Tape Cartridges

You can use the I/E station to import data cartridges into the library. The library's scanner automatically reads the barcode on new cartridges imported into the library.

Tape cartridges must be present in the I/E station and assigned to a partition before you can import them. You will select a partition into which to import the cartridges. If the selected partition is online, it will be taken offline before the import operation is performed, and brought back online after the operation is complete. If the library contains

multiple partitions, the import operation will not affect operations in other partitions.

You must have access to the library's I/E station and the operator panel to import cartridges.

Note: If your library has zero I/E station slots, you cannot import or export media using the I/E station. See Configuring I/E Station Slots on page 63.

Note: Importing cartridges using the library interface may necessitate performing an inventory on your host application. You can also import cartridges using your host application. See your host application documentation for more information.

Note: **Note on importing unassigned tape cartridges:** When the manual cartridge assignment setting is enabled (the default setting), the **I/E Assign** screen automatically appears on the operator panel after you have loaded the cartridges into the I/E station and closed the I/E station. The screen prompts you to assign the cartridges to a specific partition or to the system partition. The cartridges can then be used only by the assigned partition. If you do not wish to assign cartridges to a partition immediately, or you wish to assign them to different partitions via the Web client, you can cancel out of this screen and the cartridges are considered "unassigned." Alternatively, you can disable manual cartridge assignment (operator panel, **Setup > System Settings > Man Cart Assign**; see Manual Cartridge Assignment on page 95). In this case, the **I/E Assign** screen does not appear on the operator panel and the cartridges are considered "unassigned." Unassigned cartridges in the I/E station are available for use by any partition, including the system partition. However, you can only import or move unassigned cartridges into the library when manual cartridge assignment is disabled. Once imported or moved into a partition, the cartridges are considered assigned to that partition and can only be used by that partition.

Caution: Some host applications may fail import/export operations when the I/E station contains cartridges that are assigned to another partition. Move cartridges from the I/E station as soon as possible to avoid possible conflicts with the other partitions.

The process for importing cartridges includes the following steps:

Inserting and Assigning Cartridges

1. Verify that all tape drives are unloaded and that all cartridges are in their appropriate storage slot locations. Doing this will avoid overloading the library with cartridges.
2. Go to the front of the library and insert cartridges into the I/E station.
3. Close the I/E station.

   The **I/E Assign** screen appears on the operator panel if Manual Cartridge Assignment is enabled on the operator panel (**Setup > System Settings**).
4. If the **I/E Assign** screen appears, do the following:
   a. Using the operator panel, select the partition to which you want to assign the cartridges. All unassigned cartridges in the I/E station will be assigned to the same partition.
   b. Press **Apply**. (Alternatively, you may press **Cancel** to bypass this step if you wish to assign cartridges to different partitions using the Web client. Note that you must disable manual cartridge assignment from the operator panel before you can import unassigned cartridges, as described in the Note above.)
5. Continue using one of these options:
   - Importing Cartridges via the Operator Panel on page 119
   - Importing Cartridges via Web Client on page 120

Importing Cartridges via the Operator Panel

You can only import one cartridge at a time using the operator panel.

1. Select **Actions > Import Tape**.

2 If the cartridges in the I/E station are assigned to multiple partitions, select the partition into which you want to import.

3 Use the **Up** and **Down** buttons to select a cartridge to import.

4 Press **Import**.

The library imports the tape cartridge into the first empty slot in the partition.

Importing Cartridges via Web Client

1 Select **Operations > Media > Import**.

2 If more than one partition exists, select the partition into which you want to import cartridges and click **Next**.

3 The Import **Media - Partition (Mode)** screen appears, where **Partition** is the name of the partition and **Mode** is the current mode of the partition. This screen contains a list of cartridges in the I/E station that are ready for import.

4 Identify the number of empty storage slots that appear in the **Empty Partition Slots** field. The number of cartridges you can import is limited to the number of empty slots that exist in the partition.

5 Select the cartridges to import into the partition.

Note: You can select all cartridges by selecting the top check box. You can use the **Filter by Barcode** text box to filter the available cartridge barcodes. Click the **Help** button next to the **Find** button for more information about filtering barcodes. In addition, if not all cartridges appear on the screen, use the **Page 1 of x** arrows to view the additional cartridges.

Note: Bold column headings in the table can be sorted. For example, selecting the **Location** column heading will sort by location coordinates.

6 Click **Apply**.

7 Click **OK** to confirm it is OK to take the partition offline.

The library imports the tape cartridge(s) into the first empty slot(s) in the partition.

Bulk Loading Tape Cartridges

Bulk loading is another way to load media into the library. If zero I/E station slots are configured, you will always need to bulk load cartridges into the library. If I/E station slots have been configured, you may want to perform an initial bulk load when you first start using your library. The library will perform an inventory after the bulk load is complete.

Before bulk loading, print out the Library Configuration report from the Web client to see how the physical slots of the library are configured. The report shows what slots are unavailable or configured as cleaning slots or as I/E station slots. For information on accessing the report, see Viewing the Library Configuration Report on page 141.

Place cartridges in their appropriately configured slot location; for example, cleaning cartridges should not be placed in slots configured for storage.

To perform an initial bulk load, remove the magazine and manually insert directly into storage slots as many cartridges as you plan to use (see Releasing Magazines on page 114). When finished, reinstall the magazine and push it in until it is completely closed.

After the initial bulk load, you can use the Import Media screen to add cartridges without interrupting library operations, as long as I/E station slots have been configured. For more information, see Importing Tape Cartridges on page 117.

Moving Tape Cartridge

Once a cartridge has been imported into a library using an import/export (I/E) station and assigned to a partition, it can be moved to a tape drive for data access, to a storage slot for storage, or back to the I/E station for removal from the library.

Details on using the library to move media include:

- If your library has zero I/E station slots, you cannot move cartridges to and from the I/E station. See Configuring I/E Station Slots on page 63.
- You can move a cartridge from one location to another within a partition. You can also move unassigned cartridges from the I/E station to available locations in the library. If you move an

unassigned tape cartridge into a slot in a partition, it will become assigned to that partition and will only be available for use by that partition.

Note: If you move an unassigned tape cartridge directly from the I/E station to a tape drive, you will not be able to "unload" the tape drive later. The tape drive can only unload a cartridge if that cartridge came from a storage slot in the partition. You will need to perform a move operation to move the tape drive to a storage slot or back to the I/E station.

- Moving cartridges using the library Web client may necessitate performing an inventory on your host system. You can also move cartridges using your host application. See your host application documentation for more information.
- If the partition is online, it will be taken offline before the move is performed and brought back online after the move is complete. You will be asked to confirm that you want to take the partition offline.
- You can select only the partitions to which you have been given access.
- You can only move media within a partition at a time.

You can only perform move commands from the Web client.

Web Client

1. Select **Operations > Media > Move**.
2. If more than one partition exists, select the partition that contains the cartridge you want to move and click **Next**.

   The **Move Media - *Partition (Mode)*** screen appears, where ***Partition*** is the name of the partition and ***Mode*** is the current mode of the partition.
3. In the **Select Media** section, select the source cartridge you want to move.

Note: You can use the **Filter by Barcode** text box to filter the available cartridge barcodes. Click the **Help** button next to the **Find** button for more information about filtering barcodes. In addition, if not all cartridges appear on the screen, use the **Page 1 of x** arrows to view the additional cartridges.

Note: Bold column headings in the table can be sorted. For example, selecting the **Location** column heading will sort by location coordinates.

4 In the **Select Destination** section, select a destination location for the source cartridge.

5 Click **Apply**.

6 Click **OK** to confirm it is OK to take the partition offline.

Exporting Tape Cartridges

The Export Media operation enables you to export data cartridges from storage slots to empty I/E station slots for removal from the library.

Details on exporting cartridges include:

- Exporting cartridges using the library Web client may necessitate performing an inventory on your host application. If the host application has issued a prevent media removal command to the library, you will not be able to use the library Web client to export cartridges. In addition, you can export cartridges using your host application. For more information, see your host application documentation.
- If the partition is online, it will be taken offline before the export is performed, and brought back online after the export is complete. You will be asked to confirm that you want to take the partition offline.
- If your library has zero I/E station slots, you cannot export cartridges. See Configuring I/E Station Slots on page 63.
- If you have AutoClean enabled, you can also export cleaning cartridges. For information, see Exporting Cleaning Cartridges on page 133.

- You can select only the partitions to which you have been given access.
- You can only export cartridges if empty I/E station slots are available.
- You must have access to the library's I/E station and the operator panel to export cleaning cartridges.

Caution: Some host applications may fail import/export operations when the I/E station contains cartridges that are assigned to another partition. Move cartridges from the I/E station as soon as possible to avoid possible conflicts with the other partitions.

You can export cartridges using either the operator panel or the Web client.

Operator Panel

1. Select **Actions > I/E > Export Tape**.
2. If more than one partition exists, use the **Up** and **Down** buttons select the partition that contains the source cartridge you want to export, then press **Select**.
3. A list of all the tape cartridges in storage slots in the selected partition displays. Use the **Up** and **Down** buttons to select a tape cartridge for export.
4. Press **Export**.
5. When the screen displays confirmation that the export completed, press **OK**.
6. Once the operation completes, you may open the I/E station and remove the cartridges (see Unlocking the I/E Station on page 113).

Web Client

1. Select **Operations > Media > Export**.
2. If more than one partition exists, select the partition that contains the source cartridge you want to export.
3. Click **Next**.

The **Export Media - *Partition (Mode)*** screen appears, where ***Partition*** is the name of the partition and ***Mode*** is the current mode (online or offline) of the partition.

4 Note the number of empty I/E station slots that appear in the **Empty I/E Station Slots** field. The number of cartridges you can export is limited to the number of empty I/E station slots. You cannot export cartridges if all I/E station slots are full.

5 Select one or more cartridges for export.

Note: You can use the **Filter by Barcode** text box to filter the available cartridge barcodes. Click the **Help** button next to the **Find** button for more information about filtering barcodes. In addition, if not all cartridges appear on the screen, use the **Page 1 of x** arrows to view the additional cartridges.

Note: Bold column headings in the table can be sorted. For example, selecting the **Location** column heading will sort by location coordinates.

6 Click **Apply**.

7 Click **OK** to confirm it is OK to take the partition offline.

8 Once the operation completes, you may open the I/E station and remove the cartridges (see Unlocking the I/E Station on page 113).

Loading Tape Drives

The Load Drive operation enables you to load a cartridge from a storage slot into a tape drive. The storage slot and tape drive must be assigned to the same partition.

This topic focuses on using the library user interface, not the host application, to load tape drives. Using the library to load tape drives may necessitate performing an inventory with the host application. See your host application documentation for more information.

Details on loading tape drives include:

- The storage slot and tape drive must be assigned to the same partition.
- The tape cartridge must be compatible with the tape drive.

- If the partition is online, it will be taken offline before the load operation is performed and brought back online after the operation is complete. You will be asked to confirm that you want to take the partition offline.
- You can select only partitions to which you have been given access.
- Default tape drive locations are highlighted if the barcode field is empty or the field is cleared.

You can only load tape drives from the Web client.

Web Client

1. Select **Operations > Drive > Load**.
2. If more than one partition exists, select the partition that contains the tape drive you want to unload, and click **Next**.
3. The **Load Drive - *Partition (Partition)*** screen appears, where ***Partition*** is the name of the partition and ***Partition*** is the current mode of the partition (online or offline).
4. In the **Select Media** section, select the cartridge you want to load into a tape drive.

   Note: You can use the **Filter by Barcode** text box to filter the available cartridge barcodes. Click the **Help** button next to the **Find** button for more information about filtering barcodes. In addition, if not all cartridges appear on the screen, use the **Page 1 of x** arrows to view the additional cartridges.

   Note: Bold column headings in the table can be sorted. For example, selecting the **Location** column heading will sort by location coordinates.

5. In the **Select Destination** section, select the destination tape drive.
6. Click **Apply**.
7. Click **OK** to confirm it is OK to take the partition offline.

Unloading Tape Drives

The Unload Drive operation allows you to unload a cartridge from a tape drive to a storage slot. The storage slot and tape drive must be assigned to the same partition.

This topic focuses on using the library user interface, not the host application, to unload tape drives. Using the library to unload tape drives may necessitate performing an inventory with the host application. See your host application documentation for more information.

Details about unloading tape drives include:

- The tape drive and storage slot must be assigned to the same partition.
- Only drives with media loaded appear on the screen.
- You can select only partitions to which you have been given access.
- If the affected partition is online, it will be taken offline before the unload operation is performed, and brought back online after it is complete.

You can unload media from the operator panel or the Web client.

Operator Panel

1. Select **Actions > Tape Drive > Unload**.
2. Use the **Up** and **Down** buttons to select a tape drive to unload.
3. Press **Unload**.

Web Client

1. Select **Operations > Drive > Unload**.
2. If more than one partition exists, select the partition that contains the tape drive you want to unload.
3. Click **Next**.

   The **Unload Drive -** ***Partition (Mode)*** screen appears, where ***Partition*** is the name of the partition and ***Mode*** is the current mode of the partition. The screen contains a list of all tape drives in the partition that are loaded with a cartridge.
4. Select the tape drive you want to unload.

Note: If not all drives appear on the screen, use the **Page 1 of x** arrows to view the additional cartridges.

Note: Bold column headings in the table can be sorted. For example, selecting the **Location** column heading will sort by location coordinates.

5 Click **Apply**.

6 Click **OK** to confirm it is OK to take the partition offline.

The library attempts to unload the tape cartridge and move it into the storage slot it was in when it was originally loaded into the tape drive. If that storage slot is full, the library will attempt to move it into another empty slot in the partition. If no empty slots exist, the unload operation will fail. If this happens, you can try to perform a move operation to move the cartridge from the tape drive to an I/E station instead (see Moving Tape Cartridge on page 121), or free up a storage slot and try the unload operation again.

Cleaning Tape Drives

Library tape drives require occasional cleaning. Cleaning cartridges are used to remove accumulated residue from each tape drive's read/write head.

Cleaning slots are used exclusively to store cleaning cartridges. Configuring one or more cleaning slots enables the library's AutoClean feature for all partitions in the library. When AutoClean is enabled, the library is notified by a tape drive when cleaning is required, and the library automatically cleans the tape drive using a cleaning cartridge. For more information about the AutoClean feature, see About AutoClean on page 130.

You can configure cleaning slots during the initial library configuration or at any time in the future as long as there are licensed slots available in the library. For instructions on how to configure cleaning slots, see Configuring Cleaning Slots on page 61.

A maximum of four cleaning slots can be configured. Zero cleaning slots are configured by default.

If no licensed slots are available, you must purchase additional slots or modify or delete a partition to free existing slots. For information on how to modify partitions, see Modifying Partitions on page 57. For information on how to delete partitions, see Deleting Partitions on page 57. Cleaning slots are not assigned to specific partitions. They are shared by all partitions within a library.

You do not need to configure cleaning slots if you clean tape drives manually. For more information about manual tape drive cleaning, see Manually Cleaning Tape Drives on page 134.

You do not need to configure cleaning slots if you use host-based cleaning. Cleaning slots are not visible to the host application. To use host-based cleaning, configure zero cleaning slots in the library and set up your host application to manage the cleaning process. See your host application documentation for more information.

Valid Cleaning Cartridges

Use universal cleaning cartridges to clean tape drives. If you attempt to clean a tape drive using a non-cleaning cartridge, the library may show that the operation completed, but the tape drive will not be cleaned, and the library will issue a diagnostic ticket.

Universal cleaning cartridges are designated by labels that begin with CLN or CLNU or end with C1, C2, C3, C4, or CU. Examples: CLN123, CLNU123L1, CLN123C1, 123CU, 123C1.

About AutoClean

Configuring one or more dedicated cleaning slots automatically enables AutoClean see Configuring Cleaning Slots on page 61). Cleaning cartridges are stored in the designated cleaning slots. When a tape drive needs cleaning, it notifies the library, and the library automatically cleans the tape drive using a cleaning cartridge loaded in a cleaning slot. Automatic cleaning is integrated into routine library operations. The host application requests the library to move a tape cartridge. If the tape drive performing the operation needs cleaning, the library will perform the move operation and then automatically clean the tape drive with a cleaning cartridge before informing the host application that the move operation is complete.

When a cleaning cartridge has expired, a diagnostic ticket informs you to export the expired tape from the library. If more cleaning cartridges are present, the next cleaning cartridge will be used for the next cleaning request. If no more cleaning cartridges are available, a diagnostic ticket informs you that the tape drive needs cleaning and that a cleaning tape needs to be imported (see Importing Cleaning Cartridges on page 131 and Exporting Cleaning Cartridges on page 133).

Enabling AutoClean

To enable AutoClean, you must configure at least one cleaning slot in the library. For information on configuring cleaning slots, see Configuring Cleaning Slots on page 61.

Importing Cleaning Cartridges

When AutoClean is enabled (at least one cleaning slot has been configured), you can import cleaning cartridges from the I/E station to designated cleaning slots. For information on configuring cleaning slots, see Configuring Cleaning Slots on page 61.

When manual cartridge assignment is enabled (the default setting), you cannot import cartridges until you have assigned them to a specific partition or to the system partition. Cleaning cartridges should always be assigned to the system partition. Assigning cleaning cartridges to the system partition makes them available to all partitions in the library. For more information about manual cartridge assignment, see Manual Cartridge Assignment on page 95.

You must have access to the library's I/E station and the operator panel to import cleaning cartridges.

Caution: Some host applications may fail import/export operations when the I/E station contains cartridges that are assigned to another partition. Move cartridges from the I/E station as soon as possible to avoid possible conflicts with the other partitions.

Note: If your library has zero I/E station slots, you cannot import or export cleaning media. See Configuring I/E Station Slots on page 63.

The process for importing cleaning cartridges includes the following steps:

Inserting and Assigning Cartridges

1. Verify that there is an available, empty slot that is not assigned to a partition. If needed, free up access by modifying a partition (see Modifying Partitions on page 57).
2. Go to the front of the library and insert the cleaning cartridge(s) into the I/E station.
3. Close the I/E station.
4. If manual cartridge assignment is enabled, the **I/E Assign** screen appears on the operator panel. If manual cartridge assignment is enabled, select the **System** partition.

5 Press **Apply**.

6 Continue using one of these options:

- Importing Cleaning Cartridges via the Operator Panel on page 132
- Importing Cleaning Cartridges via the Web Client on page 132

Importing Cleaning Cartridges via the Operator Panel

1 Select **Actions > I/E > Import Cleaning Tape.**

A list of all the cleaning cartridges present in the I/E station displays.

2 Use the **Up** and **Down** buttons to select a cleaning cartridge to import.

3 Press **Import**.

The library moves the cleaning cartridge to a previously configured cleaning slot.

Importing Cleaning Cartridges via the Web Client

1 Select **Operations > Cleaning Media > Import.**

The **Operations - Import Cleaning Media** screen appears. This screen contains a list of the cleaning cartridges in the I/E station. If no cleaning slots are configured, a message appears stating that the library cannot import cleaning cartridges.

2 Note the number of empty cleaning slots that appear in the **Total Empty Cleaning Slots** field. The number of cleaning cartridges you can import is limited to the number of empty cleaning slots.

3 Select one or more cleaning cartridges to import. An error appears if the number of selected cleaning cartridges is more than the number of empty cleaning slots.

Note: If not all cartridges appear on the screen, use the **Page 1 of x** arrows to view the additional cartridges.

Note: Bold column headings in the table can be sorted. For example, selecting the **Location** column heading will sort by location coordinates.

Exporting Cleaning Cartridges

When AutoClean is enabled (at least one cleaning slot has been configured), you can export one or more cleaning cartridges from dedicated cleaning slots to the I/E station for removal from the library. You may need to export expired cleaning cartridges or free up cleaning slots for data storage.

After exporting cleaning cartridges, you can reduce the number of configured cleaning slots. The extra slots become available for use as storage slots. For information on configuring cleaning slots, see Configuring Cleaning Slots on page 61. For a description of AutoClean, see About AutoClean on page 130.

Note: If your library has zero I/E station slots, you cannot import or export cleaning media. See Configuring I/E Station Slots on page 63.

Caution: Some host applications may fail import/export operations when the I/E station contains cartridges that are assigned to another partition. Move cartridges from the I/E station as soon as possible to avoid possible conflicts with the other partitions.

The number of cleaning cartridges you can export is limited to the number of empty I/E station slots.

You can export cleaning cartridges from either the operator panel or the Web client.

Operator Panel

1. Select **Actions > I/E > Export Cleaning Tape**.
2. Use the **Up** and **Down** buttons to select a cleaning cartridge to export.
3. Press **Export**.

   The library moves the selected cleaning cartridge to an I/E station slot.

Web Client

1 Select **Operations > Cleaning Media > Export**.

The **Operations - Export Cleaning Medi**a screen appears. This screen contains a list of the cleaning cartridges in the library. The media barcode, location coordinates, media type, and cleaning status (usable/expired) are displayed for each cartridge.

2 Note the number of empty I/E station slots that appear in the **Empty I/E Station Slots** field on the right side of the screen. The number of cleaning cartridges you can export is limited to the number of empty I/E station slots.

3 Select one or more cleaning cartridges to export. An error appears if the number of selected cleaning cartridges is more than the number of empty cleaning slots.

Note: If not all cartridges appear on the screen, use the **Page 1 of x** arrows to view the additional cartridges.

Note: Bold column headings in the table can be sorted. For example, selecting the **Location** column heading will sort by location coordinates.

4 Click **Apply**.

The library moves the selected cleaning cartridge to an I/E station slot.

Manually Cleaning Tape Drives

When a tape drive needs cleaning, it notifies the library. If the library's AutoClean feature is not enabled (no cleaning slots have been configured), the library generates a diagnostic ticket informing you that the tape drive needs cleaning.

Details about manually cleaning tape drives include:

- Be sure to unload the tape drive before attempting to clean it. If the tape drive is loaded with a cartridge, it will not be available for this operation.
- Be sure to use a valid cleaning cartridge. If you use a data cartridge, for example, the operation may complete but the tape drive will not

have been cleaned, and the library will issue a diagnostic ticket. See Valid Cleaning Cartridges on page 130.

- If you have at least one cleaning slot configured (see Configuring Cleaning Slots on page 61), you use a cleaning tape from either a configured cleaning slot or the topmost I/E station slot. If manual cartridge assignment is enabled, assign the cleaning cartridge to the System partition.
  - On the Web client, you can choose to use a configured cleaning slot or the topmost I/E station slot. If two or more cleaning slots are configured and have cleaning tapes in them, the library chooses which cleaning tape to use.
  - On the operator panel, the library chooses which to use, in this order: 1) topmost I/E station slot, and 2) one of the configured cleaning slots.
- If you have zero cleaning slots configured, you must use a cleaning tape in the topmost I/E station slot. If manual cartridge assignment is enabled, assign the cleaning cartridge to the System partition.
- The associated partition is taken offline during the operation and brought back online when the operation completes. You will be asked to confirm that you want to take the partition offline.
- When the operation is complete, the library moves the cleaning cartridge back to the I/E station slot or cleaning slot.

You can clean tape drives manually at any time using commands on the operator panel or the Web client.

Operator Panel

1. Select **Actions > Tape Drive > Manual Cleaning**.
2. Use the **Up** and **Down** buttons to select a tape drive to clean.
3. Press **Clean**.
4. When the operation completes, press **OK**.

Web Client

1. Select **Tools > Drive Operations**.
2. Select **Clean a tape drive** and click **Next**.

3 If more than one partition exists, select the partition that contains the tape drive you want to clean, and click **Next**.

The **Clean Drive - *Partition (Mode)*** screen appears, where ***Partition*** is the name of the partition and ***Mode*** is the current mode (online/offline) of the partition. This screen contains a list of tape drives assigned to the partition.

4 If you have no cleaning slots configured, skip this step (you will use the top I/E station slot as the source for your cleaning cartridge). If you have at least one cleaning slot configured, you are asked to **Select Cleaning Source**. Select which location to take the cleaning cartridge from:

- **Use the top I/E slot** — Allows you to use a cleaning cartridge from the topmost I/E station slot. Make sure to install a cleaning cartridge in the topmost I/E station slot. If manual cartridge assignment is enabled, assign the cleaning cartridge to the System partition.
- **Use configured cleaning tapes** — Allows you to use a cleaning cartridge from a configured cleaning slot. If two or more cleaning slots are configured and have cleaning cartridges in them, the library chooses which cleaning cartridge to use.

5 Select one or more tape drives to clean.

Note: If not all tape drives appear on the screen, use the **Page 1 of x** arrows to view the additional tape drives.

Note: Bold column headings in the table can be sorted. For example, selecting the **Location** column heading will sort by location coordinates.

6 Click **Apply**.

7 Click **OK** to confirm it is OK to take the partition offline.

The library moves the cleaning cartridge to the tape drive and cleans it. When finished, it moves the cartridge back to the cleaning slot or I/E station.

Taking a Tape Drive Online or Offline

There are two tape drive modes: online and offline.

- **Online** — Tape drive is available for use. This is the normal operating mode for the tape drive.
- **Offline** — Tape drive is offline to the host application and is not available for cartridge load and unload (move) operations initiated by the host application, but it remains available for Web client or operator panel initiated move commands.

Note: If a cartridge is already in the tape drive when you take the tape drive offline, then the host can still read and write data on the tape.

Some operations require that the tape drive be offline. You can take a tape drive offline rather than the entire library or partition so as to minimize disruption of library operations.

This topic focuses on using the library user interface, not the host application, to change the tape drive mode. Using the library to change tape drive mode may affect the host application. See your host application documentation for more information.

Details on changing the tape drive mode include:

- The online/offline state follows the tape drive slot, not the particular tape drive (if the tape drive were to be moved to a different slot in the library).
- You can select only tape drives in partitions to which you have been given access.
- If you change the mode of a control path tape drive to offline, a caution dialog appears asking you to confirm the mode change. For information on control path tape drives, see Configuring Control Paths on page 67.

You can change the tape drive mode from both the operator panel and the Web client.

Operator Panel

1 Select **Actions > Tape Drive > Change Mode**.

2 Use the **Up** and **Down** buttons to select a tape drive.

3 Press **Modify**.

4 Use the **Up** and **Down** buttons to select **Online** or **Offline**.

5 Press **Apply**.

The new mode is displayed.

6 Press **Exit**.

Web Client

1 Select **Operations > Drive > Change Mode**.

The Change Drive Mode screen appears. This screen lists each tape drive's partition, location, state, current mode, activity, and version.

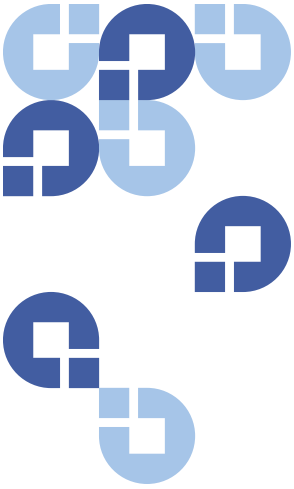
Note: If more than four tape drives are installed in the library, use the **Page 1 of x** arrows to view the additional tape drives.

2 Locate the tape drive that you want to take offline or bring online. In the tape drive table under **Mode**, the **Current** column indicates the current mode of the partition. The **New** column contains an **Online/Offline** button. The button toggles between modes.

3 Toggle the **Online/Offline** button to the desired mode.

Note: If you change the mode of a control path tape drive to offline, a caution dialog appears asking you to confirm the mode change. For information on control path tape drives, see Configuring Control Paths on page 67.

4 Click **Apply**.



Chapter 6

Getting Information About the Library

There are a number of informational screens and reports you can use to get information about the library.

This chapter covers:

- Viewing Library Information
- Viewing System Information
- Viewing the Library Configuration Report
- Saving and E-mailing the Library Configuration Record
- Viewing the Network Settings Report
- Viewing the Logged in Users Report
- Viewing the All Slots Report
- Viewing, Saving, and E-mailing Logs
- Viewing Library Information on the Operator Panel
- Using Advanced Reporting
- Viewing the Open Source License Agreement
- Viewing the Copyright Statement

Viewing Library Information

The **About** screen gives you a quick glance at the following library settings:

- Library type (Scalar i40 or Scalar i80)
- Library serial number
- Copyright date
- Library firmware version

Web Client

Select **Reports > About > Scalar i40/i80**.

Viewing System Information

The System Information report contains information about the library.

On the operator panel, the report provides:

- Physical library — serial number, firmware version, board support package (BSP) version, date and time of last firmware update
- Tape drives — online/offline mode, firmware version, model, physical serial number, logical serial number
- Robot firmware versions — XY control, picker, camera

On the Web client, the report provides:

- Date & Time — Current date, time, and time zone settings.
- Physical Library — Host name, IPv4 address, serial number, firmware version of the physical library, IPv6 addresses if IPv6 support is enabled, board support package (BSP) level, and the date the firmware was last updated.

- Library Partitions — Name, serial number, control path, status, and number of slots, media, and tape drives configured for each partition.
- Drives — Location coordinates, vendor, model, type, serial number, both physical (P-SN) and logical (L-SN), and firmware version.

Operator Panel

1. Select **Reports > About Library**.
2. Press **Next** to scroll through all the screens. Press **Exit** to exit at any time.

Web Client

Select **Reports > System Information.**

Viewing the Library Configuration Report

The **Library Configuration Report** is a dynamic representation of the various library resources, including tape drives, slots, partitions, and library chassis. The report shows which slots are assigned to partitions, I/E stations, configured as cleaning slots, or unassigned; whether the slot contains a tape drive; and whether a tape drive is the control path for its partition. You can view all slot location coordinates or media barcodes at the click of a button, and get detailed information about a specific resource by clicking on it.

You can view the report on the Web client.

Web Client

1. Select **Reports > Library Configuration**. The Library Configuration Report appears in a new window.
2. Do any of the following:
   - In the Legend, click a partition name to view information about the partition.

Note: Each partition is assigned a number and color. All slots and tape drives that are assigned to a partition are represented in the library map by the partition number and color.

- In the library map, click a specific slot to view information about the slot.
- In the library map, click a specific tape drive to view information about the tape drive.
- In the library map, click the chassis number (0) below the tape drives to view information about the chassis.
- Click Show Barcodes to display the barcodes for all imported cartridges.
- By default, the Library Configuration Report displays the coordinates for all licensed slots that are assigned to a partition. To view all library slot coordinates, click **Show ALL coordinates**.
- To print the report, click the **Print** icon in the upper right of the screen.

Clicking on a resource (tape drive, slot, partition, or chassis) brings up a detailed window containing the following information:

- **Tape Drives** — The following information is provided for each installed tape drive:
  - **Fibre Channel tape drive** — interface type, tape drive type, state (ready/not ready), status (online/offline), assigned partition name, location coordinates, media barcode (if media is in slot; "No_Label" means unreadable barcode), media type (if media is in the slot), element address, vendor, model, form factor (half height or full height), physical SN, logical SN, world wide node name (WWNN), world wide port name (WWPN), loop ID, requested topology, requested speed, actual topology, actual speed, maximum speed, tape drive firmware level, and whether the tape drive is the control path for its partition.
  - **Serial Attached SCSI (SAS) tape drive** — interface type, tape drive type, state (ready/not ready), mode (online/offline), assigned partition name, location coordinates, media barcode (if media is in slot; "No_Label" means unreadable barcode),

media type (if media is in slot), element address, vendor, model, form factor (half height or full height), physical SN, logical SN, SAS Address, tape drive firmware level, and whether the tape drive is the control path for its partition.

- **Slots** — The following information is provided for each slot: type, assigned partition name (storage and I/E station slots only), location coordinates, cartridge barcode (storage and I/E station slots only; "No_Label" means unreadable barcode), media type, element address, get count, get retries, put count, and put retries. If the slot is a cleaning slot, the cleaning status (usable/expired) and cleaning count (the number of times the cartridge was used to clean a tape drive) are also displayed.
- **Partitions** — The following information is provided for each partition: name, status (online/offline), emulation type, barcode policy, total number of tape drives, number of active tape drives, total media, mounted media, total slots, full slots, total I/E station slots, and full (occupied) I/E station slots.
- **Chassis** — The following information is provided for each chassis: manufacturer, model, and serial number.

Saving and E-mailing the Library Configuration Record

The library configuration record is a text file that contains details about the library's configuration. The configuration record can be saved or e-mailed to a specified e-mail address.Information in the library. The configuration record includes:

- Product information — Vendor, model, product ID, product version (library firmware version), and serial number
- License information — License keys installed and descriptions, installation date, and expiration date
- Primary Network Information —Host Name, DHCP enabled/disabled, IP address, netmask, gateway, Ethernet MAC, Ethernet link speed (Mbits/s), and Ethernet link present
- Chassis information — Manufacturer, model, serial number, and location

- Tape drive information:
  - Fibre Channel (FC) tape drives — Partition name, number of tape drives in partition, drive location, SCSI element address, online status, active status, ready state, vendor, model, form factor, serial number, firmware version, drive type, logical serial number, interface type, World Wide (WWN), loop ID, topology, actual topology, speed, and actual speed
  - Serial Attached SCSI (SAS) tape drives — partition name, number of tape drives in partition, drive location, SCSI element address, interface type, drive type, ready state, online status, barcode, media type, element address, vendor, model, physical serial number, logical serial number, SAS Address, firmware level, control path status

  Note: The library configuration report lists the native device identifier as reported by the tape drive. HP tape drives always report SCSI as the native device identifier, even if they are Fibre Channel or SAS. For example, if you have HP L TO-4 Fibre Channel or SAS drives, they will be listed in the report as HP LTO-4 SCSI drives.

- Partition information:
  - Library information — Number of partitions, number of cleaning slots, number of unassigned slots, number of import/export (I/E) slots, I/E manual assignment setting
  - Partition details — Partition name, number of slots, number of tape drives, and number of cartridges

Saving the Configuration Record

Administrative users can use the **Tools - Save Configuration Record** screen on the Web client to e-mail the library configuration record.

You can only save the library configuration record from the Web client.

Web Client

1. Select **Tools > Save Configuration Record**.
2. Save the file to a known location on your computer.

E-mailing the Configuration Record

Administrative users can use the **Tools - E-mail Configuration Record** screen on the Web client to e-mail the library configuration record.

Note: Do not enter more than one e-mail address in the **E-mail Address** text box on the **Tools - E-mail Configuration Record** screen. If you need to send the configuration record to multiple e-mail addresses, repeat the procedure for each e-mail address.

Before you can e-mail the configuration record, the library e-mail account must be configured. For information on setting up the e-mail account, see Configuring the Library E-Mail Account on page 74.

You can only e-mail the library configuration record from the Web client.

Web Client

1. Select **Tools > E-mail Configuration Record**.
2. Type an e-mail address into the **E-mail Address** text box.
3. Click **Apply**.

Viewing the Network Settings Report

The Network Settings report provides information on the following library settings:

- **Network** — Host name, primary DNS, and alternate DNS
- **IPv4 Settings** — DHCP enabled/disabled, IP address, gateway, and netmask
- **IPv6 Settings** (if IPv6 is enabled) — DHCP enabled/disabled, stateless configuration enabled/disabled, static configuration enabled/disabled, net prefix, gateway, and all IPv6 addresses
- **SSL** — SSL, port, and cipher
- **SMI-S** — Access (enabled/disabled) and state (enabled/disabled)

- **SNMP** — Enabled/disabled status for Access, V1, V2, V3, and encryption; algorithm; and port
- **SNMP-Traps** — IP addresses and ports

Web Client

Select **Reports > Network Settings**.

Viewing the Logged in Users Report

The Logged In Users report contains information about the users that are currently logged in to the library.

The report contains the following information about each user:

- **User Name** — User name of logged in user
- **Privilege** — Privilege level of the logged in user (Admin for administrative user, User for user)
- **Login Date/Time** — Date and time the user logged into the library
- **Last Activity Date/Time** — Date and time when the user last logged into the library
- **Login Location** — IP address or host name of the system used to access the library
- **User Interface** — User interface used to access the system (Web Client or Operator Panel)

Web Client

Select **Reports > Logged in Users**. The report appears in a new window.

Viewing the All Slots Report

The All Slots report contains information on all storage, import/export (I/E) station, and tape drive slots that are currently assigned to one or more partitions.

The report contains the following information about each slot:

- **Slot Type** — I/E station, storage, cleaning, or tape drive slot.
- **Barcode** — Barcode number of the cartridge installed in the slot. No barcode number means the slot is empty. "No_Label" means the barcode is unreadable.
- **Partition** — Partition that owns the slot (I/E station slots are shared by all partitions).
- **Location** — Location coordinates of the slot.
- **Element Address** — Element address of the slot.
- **Get Count** — The number of times the picker successfully removed a tape from the slot.
- **Get Retries** — The number of times the picker had to perform a recovery operation to remove a tape from the slot.
- **Put Count** — The number of times the picker successfully placed a tape into the slot.
- **Put Retries** — The number of times the picker had to perform a recovery operation to place a tape into the slot.

Web Client

Select **Reports > All Slots**.

Viewing, Saving, and E-mailing Logs

You can view, save, and e-mail several logs containing information about the library:

- Cleaning Log
- Diagnostic Tickets Log
- Tape Drive Log

Cleaning Log

The Cleaning Log shows all cleanings that have been performed in the library. When the log reaches its maximum size, the oldest information is replaced as new information is added.

The log provides the following information: Date Time (date and time); Barcode (barcode of the cleaning cartridge); Tape (location coordinates of the cleaning cartridge); Drive (location coordinates of the tape drive that was cleaned); Status (pass/fail); Return Code (service use only), Cleaning Type (Manual, Auto, MoveMedium), Expired ("Invalid"if the tape is expired or a data tape was improperly used to clean; "-" if not applicable); Usage Count ("N/A" if the cleaning did not complete); Reserved.

Web Client

1. Select **Reports > Log Viewer**.
2. Select **Cleaning Log** and press **Next**.
3. The report appears in a new window for viewing.
4. You can save or e-mail the report following the on-screen instructions.

Note: If you want to e-mail the log file to a recipient, type the recipient's name in the text box next to the **E-mail** button, and then click the **E-mail** button. You must have your e-mail notification configured in order to e-mail a log file. See Configuring the Library E-Mail Account on page 74 for more information.

Diagnostic Tickets Log

The Diagnostic Tickets Log records all diagnostic tickets issued by the library.

The log provides the following information: Num (ticket number to provide a consecutive listing of tickets in the order issued; the first ticket issued is assigned number 1, the second ticket 2, and so on); State (open, unopened, closed); Priority (low, high, urgent); Created (date the ticket was first issued); Last Updated (date the ticket was last issued); Cause Code (the number assigned to the fault and which appears in the full ticket name; for example, DT031- I/E Unlock Warning has cause code 31); Description; and Details.

Web Client

1. Select **Reports > Log Viewer**.
2. Select **Diagnostic Tickets Log** and press **Next**.
3. The report appears in a new window for viewing.
4. You can save or e-mail the report following the on-screen instructions.

Note: If you want to e-mail the log file to a recipient, type the recipient's name in the text box next to the **E-mail** button, and then click the **E-mail** button. You must have your e-mail notification configured in order to e-mail a log file. See Configuring the Library E-Mail Account on page 74 for more information.

Tape Drive Log

The library allows you to retrieve tape drive logs using the Web client. Tape drive log information can be used to help troubleshoot the library, the tape drive sled, and tape drive issues.

Since the log retrieval process can take up to 30 minutes, the tape drive and associated partition are automatically taken offline during the operation and brought back online when the operation completes. You will be asked to confirm that you want to take the tape drive and partition offline.

Tape drive log files adhere to the following naming convention: UDS_ID_SN.DMP, where ID identifies the tape drive coordinate location within the library and SN identifies the tape drive serial number.

Web Client

1 Select **Tools > Drive Operations**.

2 Select **Retrieve tape drive log** and click **Next**.

3 If your library contains multiple tape drive interface types, select the interface type of the tape drive from which you want to retrieve logs and click **Next**.

4 The Retrieve Drive Log screen appears. This screen lists the available tape drives.

5 Select a tape drive from which you want to retrieve logs and click **Next**.

Note: If there is more than one page of tape drives, use the **Page 1 of x** arrows to view the additional tape drives.

Note: Bold column headings in the table can be sorted. For example, selecting the **Location** column heading will sort by location coordinates.

6 Click **Apply**.

A dialog appears asking you to confirm you want to take the partition offline.

7 Click **OK**.

The Progress Window appears, displaying information on the action, elapsed time, and status of the operation.

8 If the Progress Window displays a "completed" message, you can close the window and save the file to your computer.

9 If the screen displays a "failure" message, the tape drive log was not successfully retrieved. Follow the instructions listed in the Progress Window to resolve any issues that occurred during the operation. If a complete tape drive log could not be retrieved, you may still be able to access a partial log. If so, a note will appear stating, "A complete tape drive log could not be retrieved, but a partial log is available and may be saved for further analysis once the progress window is closed."

Viewing Library Information on the Operator Panel

The operator panel provides several brief reports about the library.

Viewing Partition Information

The operator panel provides an overview of partition information. For each partition, you can see the following information:

- Online/offline mode
- Control path tape drive location coordinates
- Number of tape drives
- Number of storage slots
- Number of I/E station slots containing a tape cartridge assigned to the partition

Operator Panel

1. Select **Reports > Partitions**.
2. Use the **Up** and **Down** buttons to select a partition and click **Next**.

Viewing Network Settings

A short report on the operator panel displays the library's network settings: library name, IP address, and network configuration.

Operator Panel

1. Select **Reports > Network Settings**.
2. If IPv6 is enabled, the IPv4 information is shown on the first screen. Press **Next** to see the IPv6 address information on the next two or more screens. Although the library can have unlimited IPv6 address, a maximum of three are shown in this report.

Viewing the Date, Time, and Time Zone

The operator panel displays the current date, time and time zone configured on the library.

Operator Panel

Select **Reports > Date/Time**.

Viewing Licenses

The operator panel displays a list of all the licenses currently installed on the library: number of COD slots licensed, number of unlicensed slots, and whether Advanced Reporting is licensed.

Operator Panel

Select **Reports > Licenses**.

Using Advanced Reporting

The Advanced Reporting feature is only available if you have Advanced Reporting licensed on the library. See Licensable Features on page 11 for more information.

Advanced Reporting provides the following reports that you can configure for viewing and analysis:

- **Drive Resource Utilization Report** — Provides tape drive usage information, showing you which tape drives are working at optimum capacity and which are under-utilized. This can help you allocate your tape drive resources properly.
- **Media Integrity Analysis Report** — Provides Tape Alert count for various combinations of tape drives, tape cartridges, and Tape Alert flags. This can help you determine if a problem is due to a specific tape drive or tape cartridge.

In addition to configuring and viewing the reports, you can also:

- Save and reuse report configurations as templates.
- Save or e-mail the report data.
- Delete the data in the Advanced Reporting log files.

Required Firmware

To use all the features of Advanced Reporting, you should install the latest released version of library firmware on your library. For information on installing library firmware, see Upgrading Library Firmware on page 161.

Using the Reports and Understanding the Data

Report data is collected and displayed in a specific manner. The following notes will help you interpret the reports.

- The data for these reports is collected in log files. When the log files reach their maximum size, the oldest information is deleted as new information is added. This may affect how much historical data you can access.
- The on-screen report contains a chart and a data table. When the log files are large, it would take an excessively long time to load all the historical data into the data table. For this reason, the table only contains a maximum of 1000 rows of data (beginning with the most recent) even if the log file contains more records. (The chart displays information for the entire range.) To view all of the data, you need to save or e-mail the data file. See Saving and E-mailing Advanced Reporting Data on page 157.
- The reports are built according to data in the log files, not your current library configuration. For this reason, your library may contain tape drives or cartridges that do not show up in the report. Similarly, the report may contain tape drives and cartridges that no longer reside in the library.
- Information about a tape drive, cartridge, or operation is not recorded in the Drive Resource Utilization log file until after a tape cartridge has been mounted (loaded) *and* unmounted (unloaded) from the tape drive.
- To see the exact values of each item in the displayed chart, move your mouse so that it “hovers” over the item you wish to see. An information bubble appears with the values listed in it. If you click

on a bar, point, or slice, the information bubble locks in place and the hovering feature turns off until you reload the chart. The hovering feature does not work when the value equals zero.

- Values of zero do not appear in pie charts.

Loading and Reloading Advanced Reporting Data

When you first open an Advanced Report configuration screen, the system loads all the data from the library log file for that report to the Internet browser in preparation for creating your reports. If there is a lot of information in the log file, this may take several minutes.

The data that is loaded in the Internet browser remains unchanged until you log out of your library session or reload the data. If new data is added to the log file during your session (for example, a Tape Alert occurs), it will not appear in the on-screen report until you either log out of the library and log on again, or reload the data. To reload the data without logging out, click the **Reload** button on the report configuration page (see Figure 30 on page 159). This reloads all the data for that report, which may again take several minutes.

You can see how many records were loaded from the log file for this report by looking at the Report Data section of the report configuration page. A note says "XX records read," where XX is the number of records (see Figure 30 on page 159).

Configuring the Drive Resource Utilization Report

1. From the library menu bar, select **Reports > Advanced Reporting > Drive Resource Utilization**.

   The Drive Resource Utilization Report configuration page opens. This may take several minutes.

2. Configure the report by specifying the following:

   - Date Range — Specifies the range of time covered by the report. Choose Last 7 days; Last 4 weeks (default); Last 3 months; or All History (as far back as there is data in the log file).
   - Attribute — Specifies which value is included in the report. Select one of the following:
     - Data Written/Read (default) — The amount of data written to and read from each tape drive, shown separately in the chart.

  - Total Read and Write — The combined total amount of data written to and read from each tape drive.
  - Media Mount Count — The number of tape cartridge mounts.
  - Media Mount Time — The total amount of time media spent in the selected drive(s).
  - Media Motion Time — The total amount of time media spent in motion while in the tape drive (writing, reading, rewinding, etc.).
- Chart — How the data is displayed in the chart. Choose Area, Bar (default), Line, or Pie.
- Type — The chart type. Select one of the following:
  - Rollup (default) — Displays the Grouping on the x-axis and the Attribute amount on the Y-axis.
  - Trend — Shows how the Attribute amount changes over time for the selected Grouping.
- Grouping — Specifies which tape drive(s) or partition(s) to include in the report. Select one of the following:
  - All Drives by Coordinate (default) — Presents the sum total of the selected attribute for all tape drives according to their location in the library. If more than one tape drive resided in that location during the selected range, then the attribute values for all the tape drives that resided in that location are combined in the chart.
  - All Drives by Physical SN — Presents the sum total of the selected attribute for all drives according to the physical tape drive serial number.
  - All Partitions — Presents a comparison of all drives grouped by partition in the physical library.
  - Selected Drive by Coordinate — The report chart is based on an individual tape drive location in the library. If more than one tape drive resided in that location during the selected range, then the attribute values for all the tape drives that resided in that location are combined in the chart.
  - Selected Drive by Physical SN — The report chart is based on an individual tape drive identified by its physical drive serial number.

- Selected Partition — The report chart is based on an individual partition in the physical library.

Note: See Installed Tape Drive Location Coordinates on page 8 for an explanation of the location coordinates.

3 Click **Next**.

The report is generated and appears on the screen.

Configuring the Media Integrity Analysis Report

1 From the library menu bar, select **Reports > Advanced Reporting > Media Integrity Analysis**.

The Media Integrity Analysis Report configuration page opens. This may take several minutes.

2 Configure the report by specifying the following:

- Date Range — Specifies the range of time covered by the report. Choose Last 7 days; Last 4 weeks (default); Last 3 months; or All History (as far back as there is data in the log file).
- Attributes— Specifies which values are included in the report, and how they are combined. Select in any combination, including all (default) and none. If you select no attributes, the chart displays the Tape Alert count for the selected Grouping.
  - Cartridge Barcode — All relevant tape cartridges.
  - Drive Physical SN — All relevant tape drives.
  - Tape Alert — The Tape Alert flags that were issued. For a description of all Tape Alert flags, see Appendix B, TapeAlert Flag Descriptions.
- Chart — How the data is displayed in the chart. Choose Area, Bar (default), Line, or Pie.
- Type — The chart type. Select one of the following:
  - Rollup (default) — Displays the number of Tape Alerts for the combination of Grouping and Attributes you selected.
  - Trend — Shows the occurrence of Tape Alerts over time.
- Grouping— Specifies which drive(s) or tape cartridge(s) on which to base the report. Choose one of the following:

- All (default) — All tape drives and tape cartridges for which a Tape Alert was issued during the specified range.
- Selected Drive by Physical SN — An individual tape drive. Only tape drives which issued a Tape Alert during the specified range appear in the report.
- Selected Cartridge by Barcode — An individual tape cartridge. Only tape cartridges that were associated with a Tape Alert during the specified range appear in the report.

- Sorting — Specifies how the data will be sorted. Choose Alphabetical, Count, or Last Occurrence (default).

3 Click **Next**.

The report is generated and appears on the screen.

Saving and E-mailing Advanced Reporting Data

You cannot save the report as it appears on the screen, but you can save or e-mail the report data as a comma-separated values (.csv) file. You can then import the .csv data into a spreadsheet program and manipulate it to create your own reports for analysis. The .csv file contains all of the data in the log file that falls within the date range you specify.

1 Generate a report as described in the sections above.

2 Scroll down to the bottom of the report viewing screen to a box titled **Retrieve the Report Data File**. See Figure 29.

3 To save the report data as a .csv file, click **Save**.

4 To e-mail the report data as a .csv file, type the name of a recipient in the empty field next to the **E-mail** button, then click **E-mail**.

Figure 29 Saving and E-mailing the Report Data

Creating and Using a Template

If you want to use the same configuration repeatedly, you can save it as a template. You can save up to 20 templates for each type of advanced report. See Figure 30 on page 159.

1. From the report configuration page, make the selections you want.
2. In the **Report Templates** box at the bottom of the screen, type a name for the template in the empty field next to the **Save** button. The name can have a maximum of 15 characters. You can use only lowercase letters, numbers, and the underscore character (_) in template names.
3. Click **Save**. The report appears in the drop-down menu next to the **Load** button.
4. To use a saved template, select the template from the drop-down list and click **Load**.
5. To delete a template, select the template from the drop-down list and click **Delete**.

Deleting Advanced Reporting Data

In some circumstances, you may wish to delete the data contained in the library log files used to build the advanced reports. To do this, click the **Delete** button in the **Report Data** section of either report configuration page. This deletes the data for both the Drive Resource Utilization report and the Media Integrity Analysis report. See Figure 30 on page 159.

Caution: Once you delete the data in the log files, you cannot get it back. The **Reload** button does NOT retrieve deleted data! It is recommended that you save all the data for both the Drive Resource Utilization report and the Media Integrity Analysis report before deleting the data. See Saving and E-mailing Advanced Reporting Data on page 157.

Figure 30 Template and Report Data Functions

1	Loads the selected template.
2	Template drop-down list.
3	Deletes the selected template.
4	Saves a report configuration as a template.
5	Type name of new report here.
6	Reloads the data from the library log file to the Internet browser.
7	Lists the number of records currently loaded in the Internet browser for this report.
8	Deletes all the Advanced Reporting data.

Viewing the Open Source License Agreement

A number of open source packages were used to create the library firmware. You can view the open source license agreement on the Web client.

Web Client

Select **Reports > About > Open Source Licenses**.

Viewing the Copyright Statement

Operator Panel

Select **Reports > Copyright Statement**.

Web Client

Available in the Web client online help. To view the help, click the **Help** icon in the upper right corner of the screen.

Chapter 7
Updating Firmware

This chapter covers updating library and tape drive firmware, including:

- Upgrading Library Firmware
- Updating and Autoleveling Tape Drive Firmware
- About Tape Drive Firmware Autoleveling
- Uploading Tape Drive Firmware Used in Autoleveling
- Deleting Tape Drive Firmware Used in Autoleveling
- Initiating Tape Drive Firmware Autoleveling

Upgrading Library Firmware

The library firmware update operation allows you to update library firmware using the Web client. With the library firmware update operation, you can upgrade firmware to a later version or downgrade firmware to an earlier version. Upgrading library firmware can take up to 30 minutes.

The latest firmware and installation instructions are available at: http://www.quantum.com/ServiceandSupport/SoftwareandDocumentationDownloads/SI40/Index.aspx

Navigate to the appropriate firmware version and download the file to your computer hard drive. Library firmware comes bundled with tape drive firmware, firmware update instructions, and release notes. Verify with the release notes or technical support that you are updating the library with the correct version of firmware. For technical support contact information, see Getting More Information or Help on page xxiv.

Before updating library firmware, it is recommended to capture the library snapshot. The library snapshot file saves status information and trace logs for library components. This information helps technical support troubleshoot issues that might occur with the firmware upgrade. For more information, see Capturing the Library Snapshot on page 247. In addition, it is recommended to save the library configuration before upgrading the library (in case the upgrade fails) and again after the upgrade successfully completes. For more information, see Saving the Library Configuration on page 101.

When you upgrade or downgrade library firmware, the library also autolevels tape drive firmware, if needed. Autoleveling will not occur if a tape drive has a cartridge loaded in it. Make sure to unload all tape drives before updating library firmware. See Updating and Autoleveling Tape Drive Firmware on page 164.

The library automatically restarts after the firmware update is complete. Before logging into the library, clear the Web browser cache. See your Web browser's documentation for instructions on how to clear the cache.

Caution: After the update process starts, you must wait until it completes. Do not attempt to interrupt the process in any way, and do not power cycle the library. Loss of data or library operability could occur.

Note: **If you downgrade library firmware** to an earlier version using the firmware upgrade process, library configuration settings will be reset to the factory defaults (see Resetting Factory Defaults on page 261). You must manually reconfigure your library's settings.

You can only update firmware from the Web client.

Web Client

1. Unload tape cartridges from all tape drives installed in the library.
2. Capture a library snapshot (see Capturing the Library Snapshot on page 247).
3. Save the library configuration (see Saving the Library Configuration on page 101).
4. Library firmware is available at: http://www.quantum.com/ServiceandSupport/SoftwareandDocumentationDownloads/SI40/Index.aspx. Navigate to the appropriate firmware version and download the file to a known location on your computer.
5. Verify with the release notes or technical support that you are updating the library with the correct version of firmware.
6. From the Web client, select **Tools > Update Library Firmware**.

   The **Tools - Update Library Firmware** screen appears.
7. Click **Browse**.
8. Locate the library firmware file and click **Open**.
9. Click **Apply**.

   A confirmation dialog box appears asking you to confirm that you want to update the library firmware and restart the library.
10. Click **OK** to continue with the library firmware update operation.

    The Progress Window appears. The Progress Window contains information on the action, elapsed time, and status of the requested operation. The Progress Window closes automatically and the library shuts down and then reboots. You will need to log back into the library once it has finished rebooting. Wait for the library to completely reboot before logging back in to the library. The reboot takes several minutes.

    If **Failure** appears in the Progress Window, the operation failed. Follow the instructions listed in the Progress Window to resolve any issues that occurred during the operation. The library will automatically reload the previous version of library firmware.
11. Clear the Web browser cache before logging in to the library. See your Web browser's documentation for instructions on how to clear the cache.
12. Log in to the library.

Note: If the library is still in the process of restarting, the Web browser may display an error page or message when you try to access or log in to the Web client.

13 Verify the library firmware installed successfully by viewing the About Scalar i40/i80 report (on the Web client, select **Reports > About > Scalar i40/i80**).

14 Save the library configuration again (see Saving the Library Configuration on page 101).

Updating and Autoleveling Tape Drive Firmware

The library firmware contains baseline tape drive firmware image that Quantum has validated. Tape drive firmware is installed at the same time as library firmware. (You can also install upgrades or patches separately, which is described in the sections below.)

In addition, the library is equipped with a tape drive autoleveling feature, that automatically updates firmware on all installed tape drives, keeping all tape drives of the same type at the same firmware level.

About Tape Drive Firmware Autoleveling

Tape drive firmware is verified on these occasions:

- whenever a tape drive is added, replaced, or power cycled, or
- when the library is rebooted.

If the firmware installed on the tape drive does not match the tape drive firmware installed on the library, the tape drive firmware is autoleveled. Tape drive firmware is also autoleveled when library firmware is updated (see Upgrading Library Firmware on page 161).

Details about Autoleveling include:

- The autoleveling feature is always enabled.
- The library firmware contains baseline tape drive firmware image that Quantum has validated. You cannot delete any of the baseline tape drive firmware images. You may, however, upload separate

tape drive firmware images to use instead (such as a patch or upgrade provided by Quantum; see Uploading Tape Drive Firmware Used in Autoleveling on page 166). If you upload a patch, the patch will display instead of the baseline image, although the baseline image will remain, hidden. Tape drives will be autoleveled to the patch. If you delete the patch, then baseline image will reappear on the screen and the tape drives will autolevel to the baseline image (see Deleting Tape Drive Firmware Used in Autoleveling on page 168).

- If you upgrade library firmware, the baseline tape drive firmware for that version of library firmware will overwrite the existing baseline tape drive firmware images. If you did not previously upload a patch, all the tape drives will be autoleveled to the new baseline. If you previously uploaded a patch, the patch remains and tape drive firmware will remain autoleveled to the patch. You will need to delete the patch in order to have the tape drives autoleveled to the new baseline (see Deleting Tape Drive Firmware Used in Autoleveling on page 168).
- If you downgrade library firmware, the baseline tape drive firmware for that version of library firmware will overwrite the existing baseline tape drive firmware images as well as any patches you may have uploaded prior to the downgrade, and all tape drives will be autoleveled to the new baseline. If you want to continue to use the patch or a different version of tape drive firmware, you will need to upload it again. Contact Technical Support if you need help obtaining firmware (see Getting More Information or Help on page xxiv).
- Autoleveling will not occur if a tape drive has a cartridge loaded in it. Make sure to unload tape cartridges from all tape drives before loading new firmware for autoleveling, or before upgrading library firmware.
- Autoleveling occurs after the robot completes its initialization. This means it is possible for a host to see the medium changer initially, but when the autoleveling starts on the drives it is likely the medium changer will disappear again. Wait until autoleveling completes before starting backup applications. (The operator panel displays a message indicating autoleveling is taking place. Wait until this message disappears before starting backup applications.)
- If you reset factory defaults, any tape drive firmware images you loaded will be deleted (see Resetting Factory Defaults on page 261).

Uploading Tape Drive Firmware Used in Autoleveling

Tape drive firmware is included with the library firmware bundle and is automatically autoleveled on your tape drives when you install library firmware (see About Tape Drive Firmware Autoleveling on page 164). In some cases, a tape drive firmware upgrade or patch may be available outside of the normal library firmware release cycle. In this case, the tape drive firmware will be available as a separate download from the Quantum Web site at: http://www.quantum.com/ServiceandSupport/SoftwareandDocumentationDownloads/SI40/Index.aspx.

Caution: Only install tape drive firmware image files that have been tested and qualified by Quantum.

If you want to install tape drive firmware from an earlier version that is no longer available on the Quantum Web site, contact Quantum Support.

It is not necessary to delete an old version of firmware before uploading a new version. The new version overwrites the old version.

Note: Uploading tape drive firmware for autoleveling only uploads the firmware to the library in preparation for autoleveling. It does not initiate autoleveling or install firmware on the tape drive. To initiate autoleveling, see Initiating Tape Drive Firmware Autoleveling on page 169.

You can only upload tape drive firmware on the Web client.

Web Client

1. Tape drive firmware (if released separately) will be available at: http://www.quantum.com/ServiceandSupport/SoftwareandDocumentationDownloads/SI40/Index.aspx. Navigate to the appropriate firmware version and download the file to a known location on your computer.
2. Verify with the release notes or Quantum Support that you are updating the library with the correct version of firmware. For technical support contact information, see Getting More Information or Help on page xxiv.
3. Select **Tools > Drive Operations**.

   The **Tools - Drive Operations** screen appears.

4 Select **Upload/remove tape drive firmware for autoleveling** and click **Next**.

   The **Tape Drive Firmware Autolevel** screen appears. The screen lists the vendor, type, interface type, form factor, and firmware revision number for all tape drives that the library supports, whether or not they are installed in the library.

5 Click **Upload**.

   The **Upload Tape Drive Images** screen appears. The screen lists the vendor, type, form factor, and interface type of all tape drives installed in the library. You can only upload tape drive images for the listed tape drives.

6 Click **Browse**.

7 Locate the tape drive firmware image file and click **Open**.

8 Click **Apply**. The Progress Window appears. The Progress Window contains information on the action, elapsed time, and status of the requested operation. Do one of the following:

   - If **Complete** appears in the Progress Window, the tape drive firmware upload completed. Check to see if a diagnostic ticket was generated for this operation. For information on diagnostic tickets, see About Diagnostic Tickets on page 244. If no diagnostic ticket(s) exists, continue to next step.
   - If **Failure** appears in the Progress Window, the tape drive firmware update was not successful. Follow the instructions listed in the Progress Window to resolve any issues that occurred during the operation.

9 To initiate autoleveling, see Initiating Tape Drive Firmware Autoleveling on page 169.

Deleting Tape Drive Firmware Used in Autoleveling

If you installed a tape drive firmware image to override the library's baseline image used for autoleveling, you can delete it. You cannot delete the library's baseline tape drive firmware images. For more information, see About Tape Drive Firmware Autoleveling on page 164.

Note: Deleting tape drive firmware for autoleveling only deletes the firmware and makes the library's baseline tape drive firmware available for autoleveling. It does not initiate autoleveling or install firmware on the tape drives. To initiate autoleveling, see Initiating Tape Drive Firmware Autoleveling on page 169.

You can only delete tape drive firmware on the Web client.

Web Client

1. Select **Tools > Drive Operations**.

   The **Tools - Drive Operations** screen appears.

2. Select **Upload/remove tape drive firmware for autoleveling** and click **Next**.

   The **Tape Drive Firmware Autolevel** screen appears. The screen lists the vendor, type, interface type, form factor, and firmware revision number for all tape drives that the library supports, whether or not they are installed in the library.

3. Select the tape drive firmware you want to delete.

4. Click **Delete**.

   The Progress Window appears. The Progress Window contains information on the action, elapsed time, and status of the requested operation. Do one of the following:

   - If **Success** appears in the Progress Window, the tape drive firmware was successfully deleted. The library's default baseline tape drive firmware will now be used for autoleveling.
   - If **Failure** appears in the Progress Window, the tape drive firmware update was not successfully deleted. Follow the instructions listed in the Progress Window to resolve any issues that occurred during the operation.

5. To initiate autoleveling, see Initiating Tape Drive Firmware Autoleveling on page 169.

Initiating Tape Drive Firmware Autoleveling

Autoleveling occurs automatically at specific times (whenever a tape drive is added, replaced, or power cycled; or when the library is rebooted). If you upload or remove tape drive firmware separately from library firmware (such as a Quantum-provided upgrade or patch) and want to autolevel the tape drives immediately, follow these steps:

1. Unload tape cartridges from all tape drives you want to autolevel.
2. Stop all host commands to the tape drives you want to autolevel.
3. Initiate autoleveling by performing one of the following actions:
   - **Reset (power cycle) the tape drives** on which you want to install firmware. This autolevels only the tape drives you reset. For instructions, see Resetting a Tape Drive on page 260.
   - **Restart the library.** This verifies and autolevels all tape drives. (From the Web client, select **Operations > System Shutdown**. Select **Restart** and click **Apply**. See Restarting the Library on page 109 for more information.)

   The operator panel displays a message indicating autoleveling is taking place. The firmware install/autolevel takes about 7 minutes in addition to whatever time it takes to complete the process you chose above. If the install or autolevel fails, you receive a diagnostic ticket.
4. Wait until autoleveling is complete before resuming host commands. To make sure autoleveling is complete, check the system information report to see if the tape drive firmware is installed on all intended tape drives. From the Web client, select **Reports > System Information.**

Chapter 8
Installing, Removing, and Replacing Components

This chapter describes how to add, remove, and replace hardware components within your library.

WARNING: Two people are required to lift and install the library.

WARNING: Under no circumstances should a rack be moved while a library is installed.

This chapter covers:

- Taking ESD Precautions
- Connecting Library Cables
- Installing the Rack Mount Kit (Rail Kit)
- Installing the Library In a Rack
- Removing the Library From a Rack
- Installing the Library in a Desktop Kit
- Removing the Library from a Desktop Kit
- Removing and Replacing the Front Bezel
- Removing and Replacing the Chassis
- Removing and Installing a Filler Plate

- Removing and Replacing a Magazine
- Removing and Installing a Power Supply
- Removing and Replacing the System Control Board
- Removing and Replacing a Tape Drive
- Packaging the Library for Moving or Shipping
- Replacing the Robot

Taking ESD Precautions

Some components within the Scalar i40 and Scalar i80 libraries contain static-sensitive parts. To avoid damaging these parts while performing installation procedures, always observe the following precautions:

- Use an antistatic wrist strap. If you do not have one, touch the outside of the library on the sheet metal before touching any components to discharge static from your body.
- Keep static-sensitive parts in their original shipping containers until ready for installation. Look for the ESD sticker to identify static sensitive parts.

- Avoid touching connectors and other components.

Note: Dry climates and cold-weather heating environments have lower relative humidity and are more likely to produce static electricity.

Connecting Library Cables

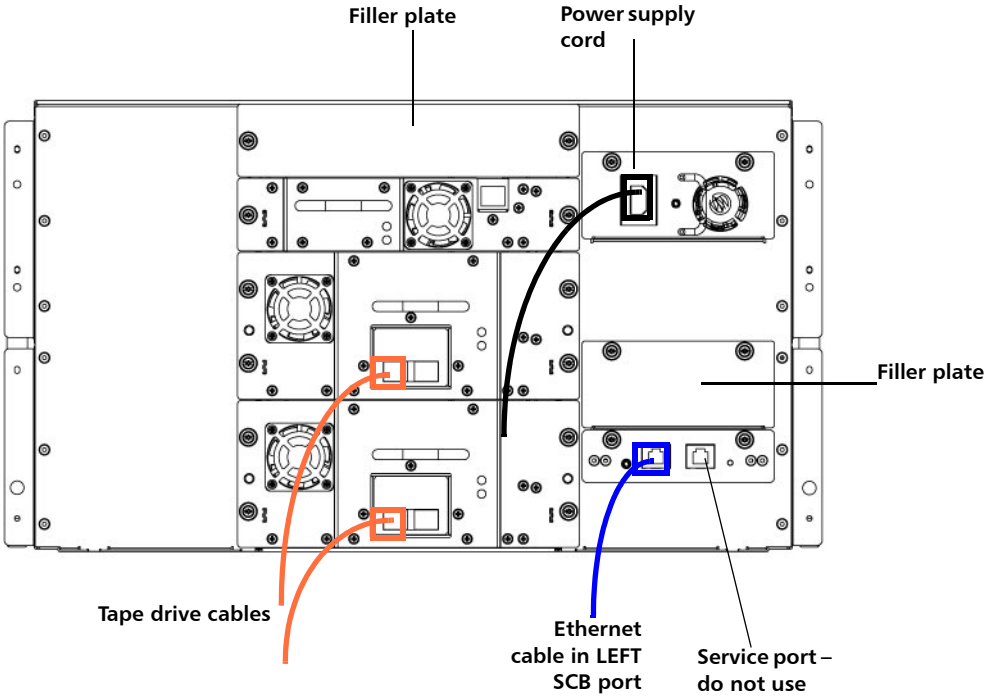
Connect the cords and cables as follows (see Figure 31 on page 174). It is recommended that you leave some slack in the cables to allow you to perform certain replacement procedures in the future.

1. Connect the tape drive cables from the tape drives to the host.

   Caution: Use care when handling the fibre optic cables. Do not crimp or bend the cables. Do not exceed the bend radius specified by the manufacturer.

2. Connect an Ethernet cable (not supplied with your library) into the LEFT port on the system control board (SCB). The right SCB port is for service use only; do not use. Connect the other end of the Ethernet cable into a live Ethernet jack connected to your network.
3. Connect the power supply cord into the power supply connector. Plug the other end of the cord into a grounded AC outlet.

Figure 31 Reinstalled Components



Installing the Rack Mount Kit (Rail Kit)

The instructions for installing the rails are the same for both the Scalar® i40 and the Scalar i80.

WARNING: If the rack is empty at the time of installation, do NOT install the library too high in the rack. The weight of the library may cause the rack to become “top heavy” and unstable if installed in the top of an empty rack.

WARNING: Do not stack objects on top of the library such as cables or other computer equipment. The additional weight could exceed the amount supported by the rack shelves.

Caution: Make sure the rack mounting rails are level, both left to right and front to back. If the library is not level in the rack, it will not work properly.

Supported Rack Types

The Scalar i40 and Scalar i80 libraries are designed to fit in most standard 19-inch equipment cabinets, including:

- Dell, 08P157 (US-08P157910-3AU-0900),square, 2.48 - 2.72 mm thick
- SUN, 38U, NGR900R, M6
- Emcor, 10 Series, round hole
- IBM, Machine Type 9306, Model 900, square, 28.25-inch deep, 2.0-2.25 mm thick
- HP, 10K, PN 245169-001, Asm 10642U GR Metallic, square, 2.0-2.2 mm thick
- EMC CX500
- Rittal Cable Tester Rack Frame, square

Rack depth of 34 in. (86.3 cm) minimum is recommended; however, rack depths of 24 to 36 in. (60.9 to 91.4 cm) are supported.

Space Requirements

See the following:

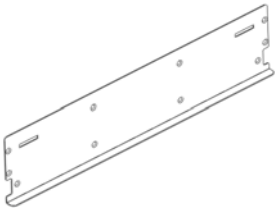
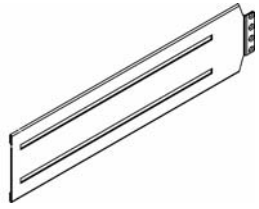
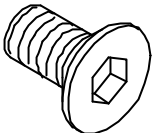
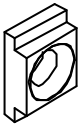
- Physical Specifications on page 269 and
- Air Clearance Requirements on page 271

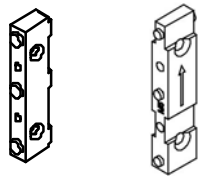
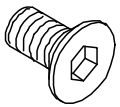
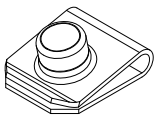
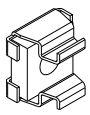
Tools Required

- Allen wrench (2.5 mm) — provided in the library accessory kit
- Allen wrench (3 mm) — provided in the library accessory kit
- Magazine lock override tool — an opened paperclip, small screwdriver, or other object (3.5 mm or less in diameter that will not break off)

Rack Mount Kit Contents

The following items are included in the rack mount kit:

Qty	Figure	Description
2		Shelf
2		Shelf Extender
16		Allen head screw, countersunk (M5 x 10) – for shelf assembly
8		T- nut (M5) – for shelf assembly

Qty	Figure	Description
8 total		Rail adapter – 4 each of two types are included. You need 4 for installation; choose the type appropriate for your rack (for more information, see Figure 34 on page 180)
8		Allen head screw, countersunk (M4 x 12) – for mounting shelves to rack
8		Washer, countersunk – for mounting shelves to rack
4		Clip nut (M5 x 0.8) – for securing library in rack
4		Cage nut (M5) – to secure library to rack. Used in racks with square or round non-threaded holes.

Installing the Rack Mount Shelves

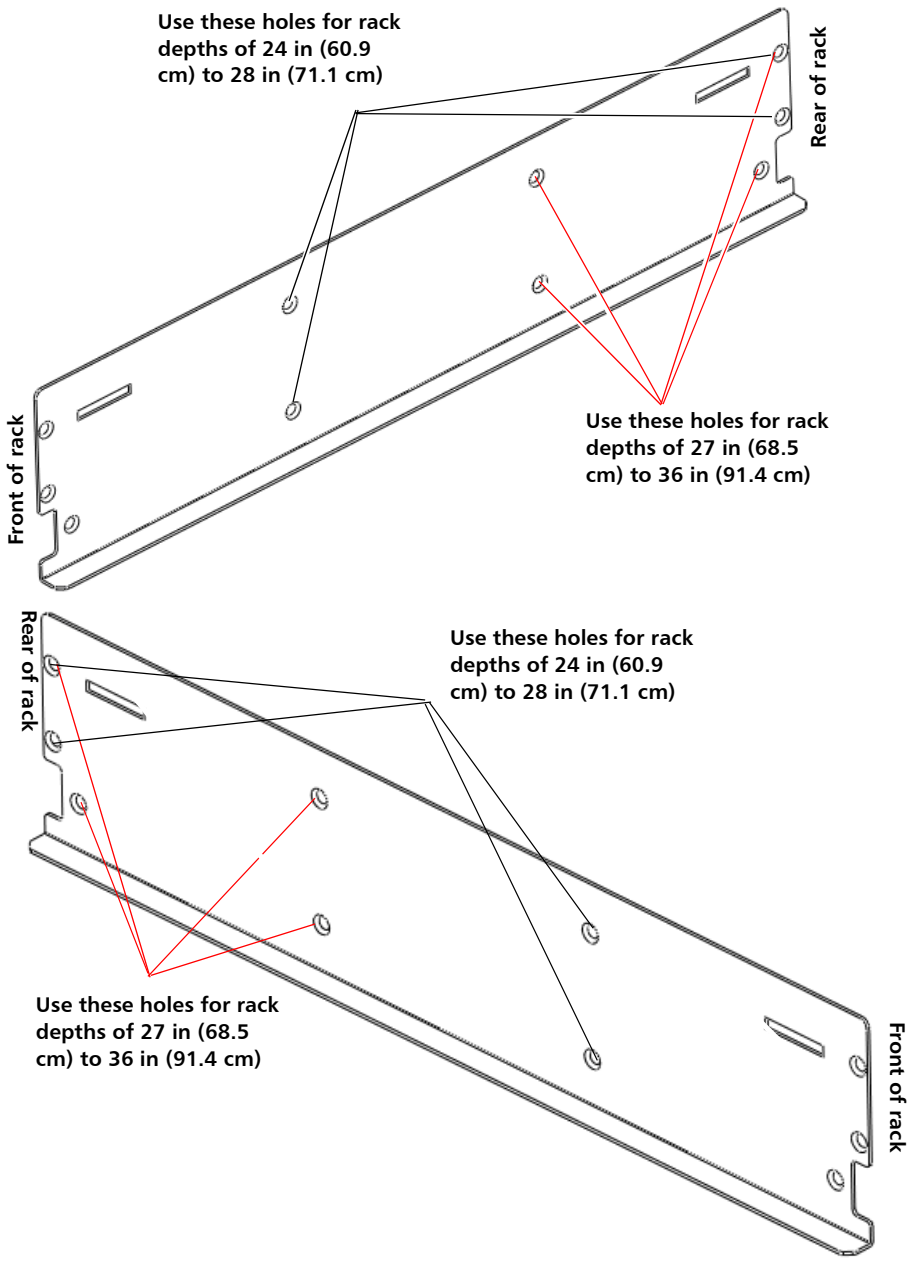
Before installing the rack mount shelves, you must collect the following information:

- Type of rack mount rails (square hole, through hole, or threaded hole)
- Depth of rack

1 Assemble the rack mount shelves included in the accessory kit (left and right):

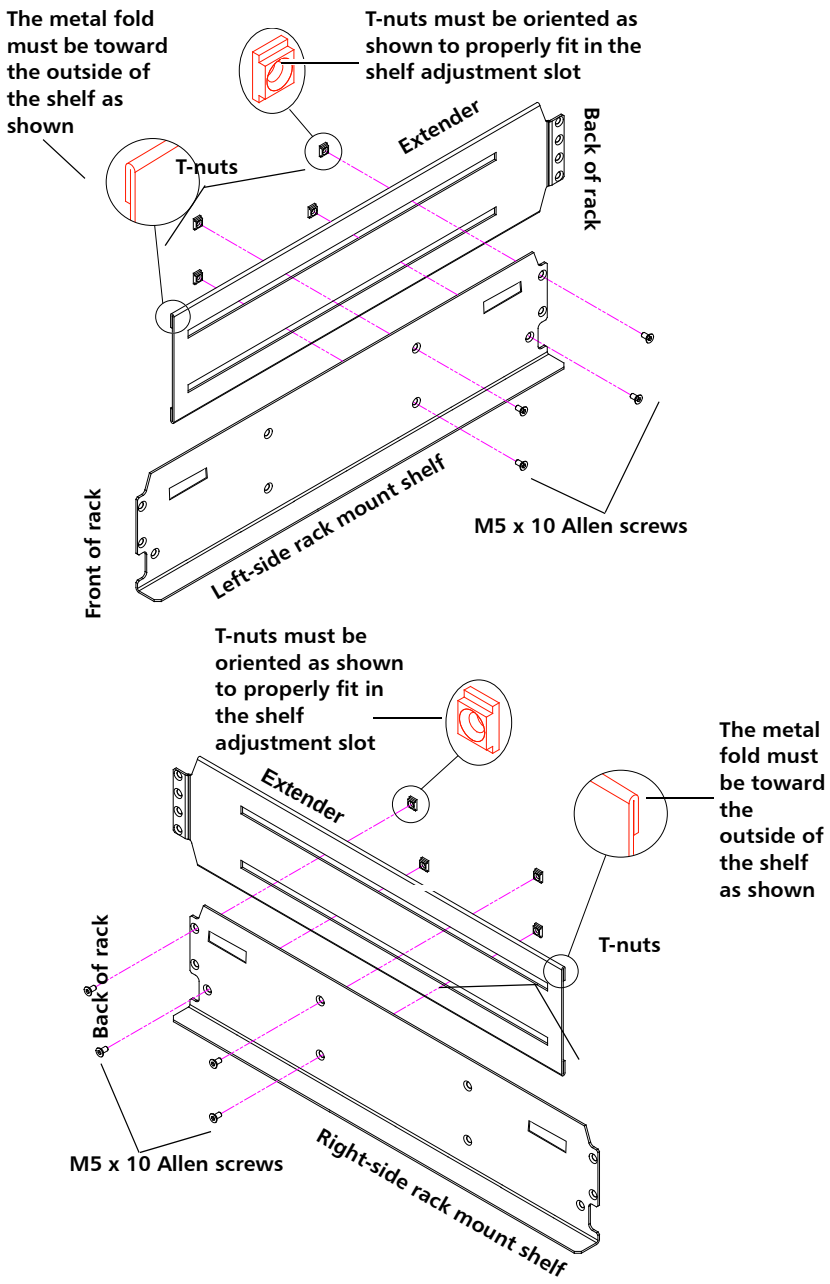
a The holes used to attach the two halves of the rack mount shelves differ depending on the depth of the rack (see Figure 32 on page 178). It is recommended that you use the ones that are exposed and have the widest spacing.

Figure 32 Rack Mount Shelf Depth Requirements


Use these holes for rack depths of 24 in (60.9 cm) to 28 in (71.1 cm)
Rear of rack
Front of rack
Use these holes for rack depths of 27 in (68.5 cm) to 36 in (91.4 cm)
Rear of rack
Use these holes for rack depths of 24 in (60.9 cm) to 28 in (71.1 cm)
Use these holes for rack depths of 27 in (68.5 cm) to 36 in (91.4 cm)
Front of rack

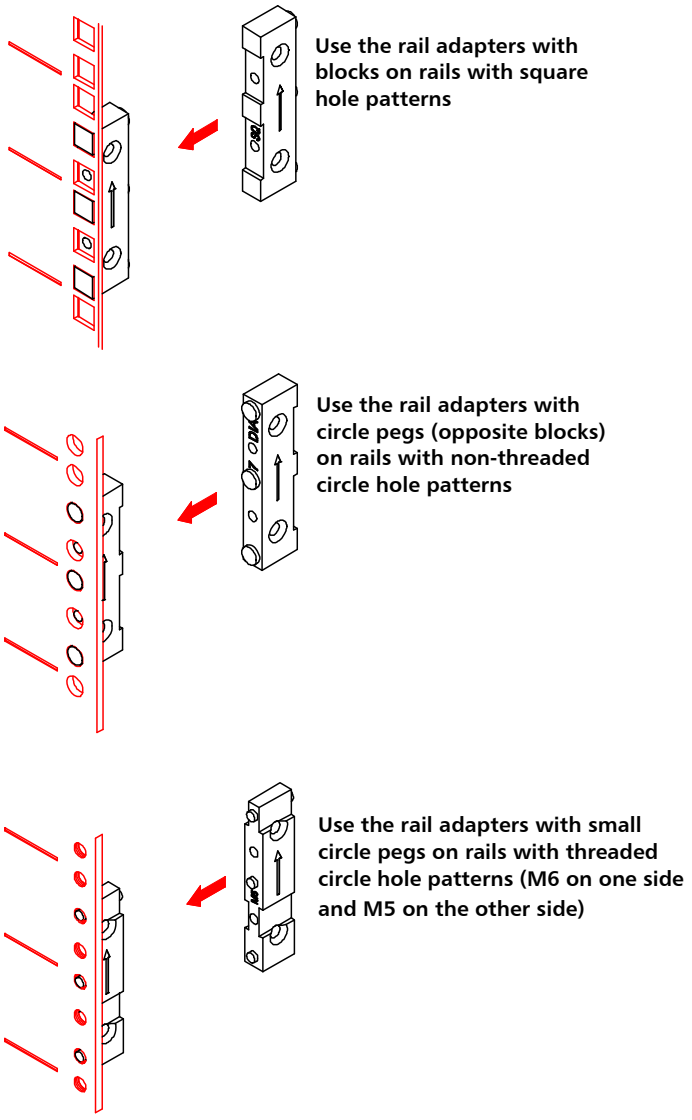
b Loosely attach the rack mount shelves to the extenders with 4 M5 x 10 Allen screws and T-nuts (see Figure 33).

Figure 33 Assembling the Left and Right Rack Mount Shelves


The metal fold must be toward the outside of the shelf as shown
T-nuts must be oriented as shown to properly fit in the shelf adjustment slot
Extender
Back of rack
T-nuts
Front of rack
Left-side rack mount shelf
M5 x 10 Allen screws
T-nuts must be oriented as shown to properly fit in the shelf adjustment slot
Extender
The metal fold must be toward the outside of the shelf as shown
T-nuts
Back of rack
M5 x 10 Allen screws
Right-side rack mount shelf

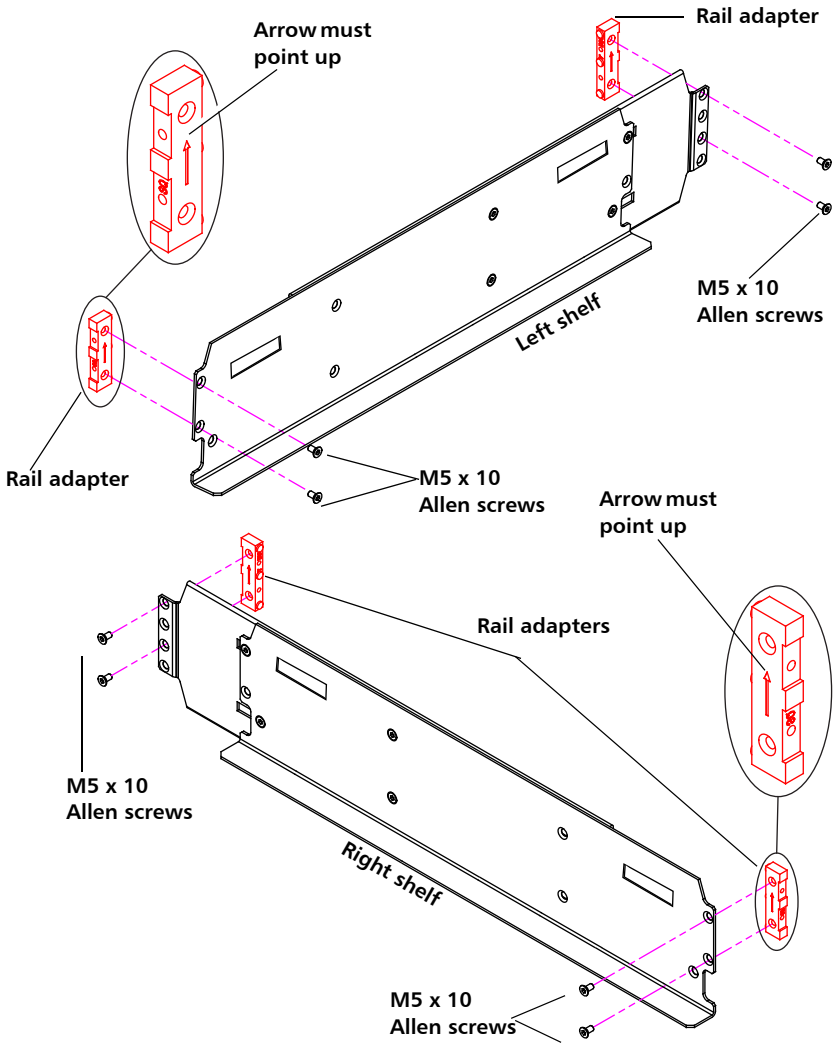
c Determine the type of rail adapter required for your rack. Each rail adapter is marked with the specific hole type supported (see Figure 34).

Figure 34 Rail Adapter Types


Use the rail adapters with blocks on rails with square hole patterns
Use the rail adapters with circle pegs (opposite blocks) on rails with non-threaded circle hole patterns
Use the rail adapters with small circle pegs on rails with threaded circle hole patterns (M6 on one side and M5 on the other side)

d Attach the appropriate rail adapter to the front and back of the rack mount shelves (right and left) with 2 M5 x 10 Allen screws per adapter (see Figure 35).

Figure 35 Assembling the Left-Hand Rack Mount Shelf

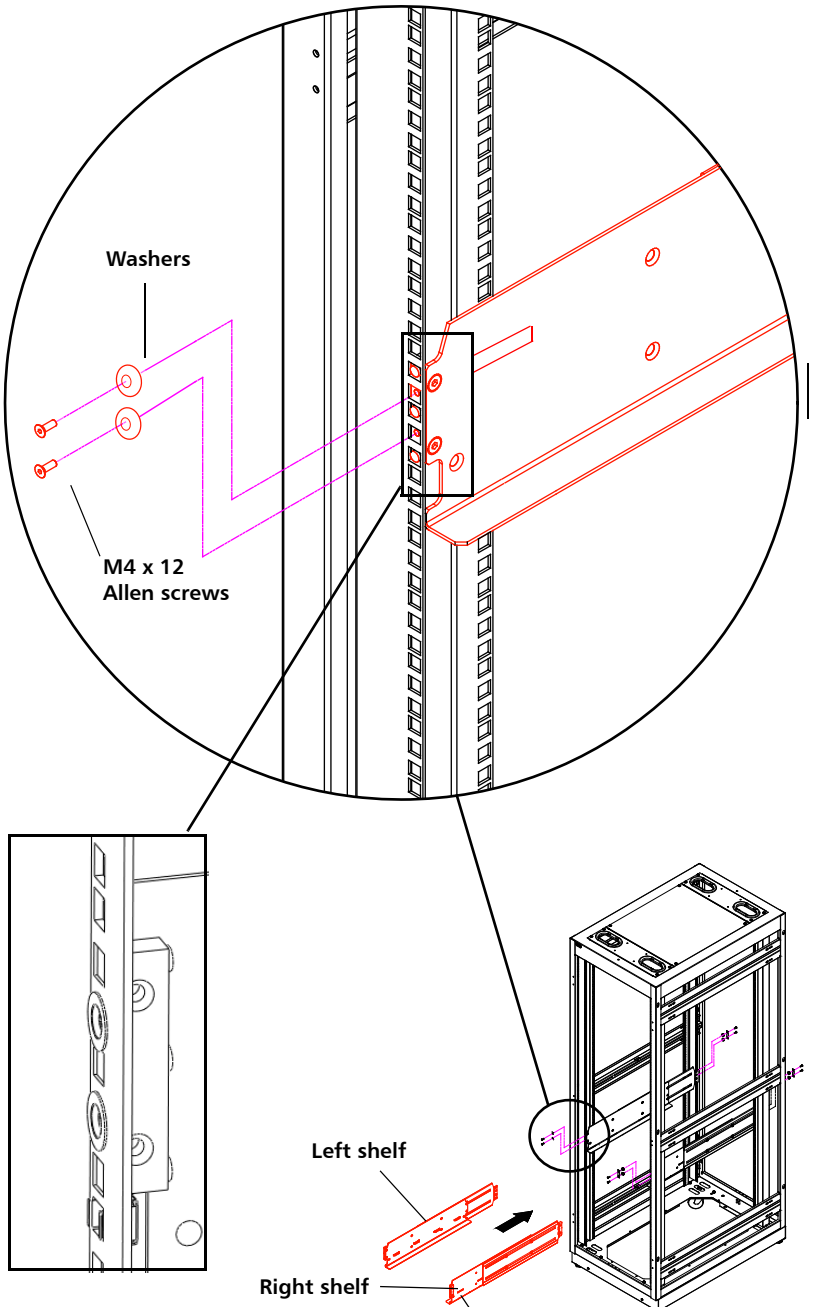


2 Install the left and right rack mount shelves into the rack (the rack mount shelves adjust 24 to 36 in.) and secure with the following parts in four locations (see Figure 36 on page 183):

- 2 washers
- 2 M4 x 12 Allen screws

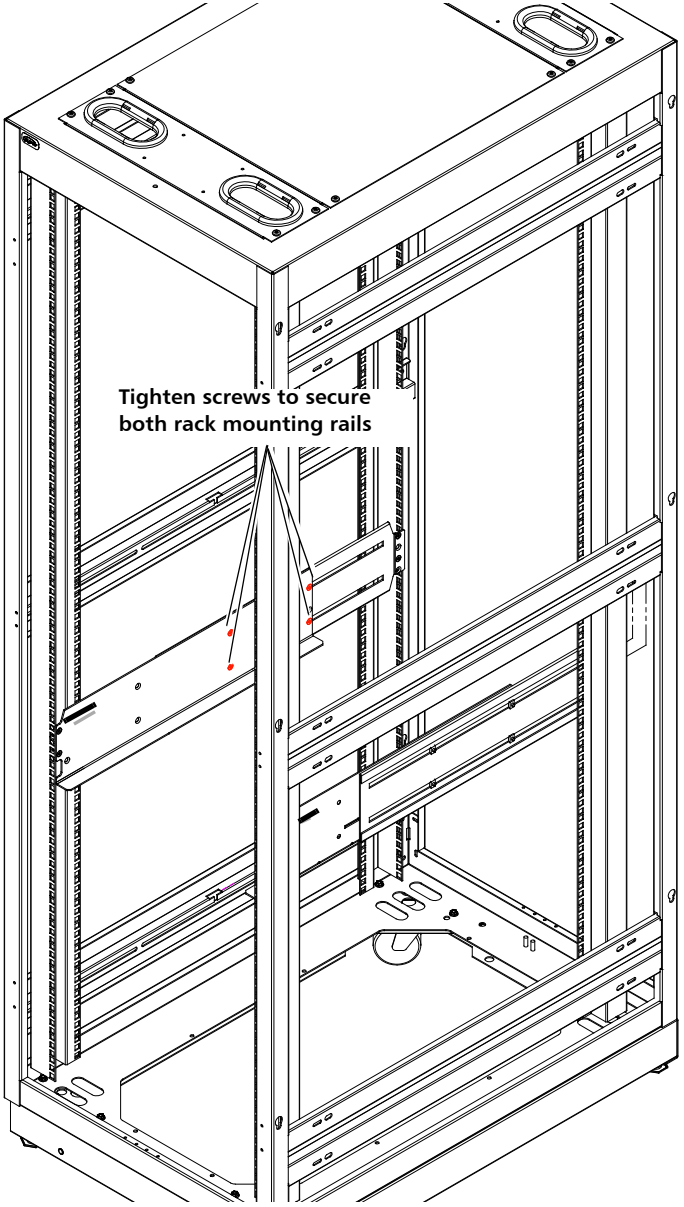
Note: The rack mount shelves must be installed on the inside rack rails.

Figure 36 Installing the Rack Mount Shelves



3 Once the rack mount shelves are secured to the rack, tighten the Allen screws securing the adjustable shelves (right and left) together (see Figure 37).

Figure 37 Tightening the Rack Mount Shelves



4 If the rack does not have threaded holes, install a clip nut or a cage nut in the back side of the rail, in the first empty hole below the rail adapter. This is what you will screw the library thumbscrews into to secure the library in the rack. See table below for type of nut, and Figure 38 on page 186 for installation location.

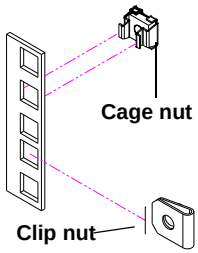
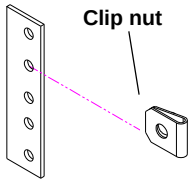
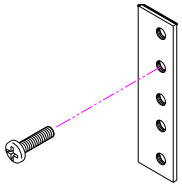
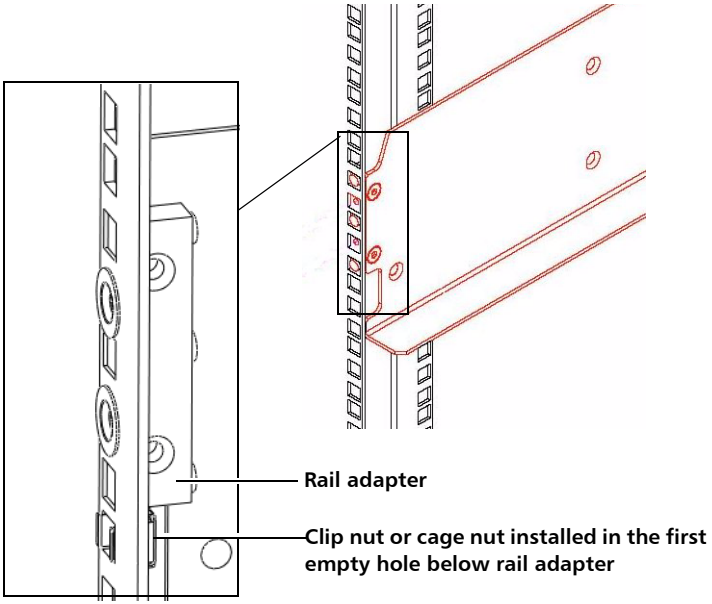
Type of Rail/Type of Nut	Description
	Square rack holes are the most common type of rack holes. They can accept either cage nuts which mount from the back of the rail or clip nuts which clip on from the side of the rack rail.
	Round, unthreaded holes require clip nuts to accept mounting hardware.
	Threaded holes require neither cage or clip nuts to accept mounting hardware.

Figure 38 Location for Installing the Clip Nut or Cage Nut



Installing the Library In a Rack

Caution: Make sure the rack mounting rails are level, both left to right and front to back. If the library is not level in the rack, it will not work properly.

WARNING: At least two people are required to lift and install the library.

1 If tape drives are installed in the library, you may wish to remove them to reduce weight. To remove tape drives, unscrew the captive thumbscrews securing them to the back of the library and slide them out of the library. Set them down gently on a stable surface.

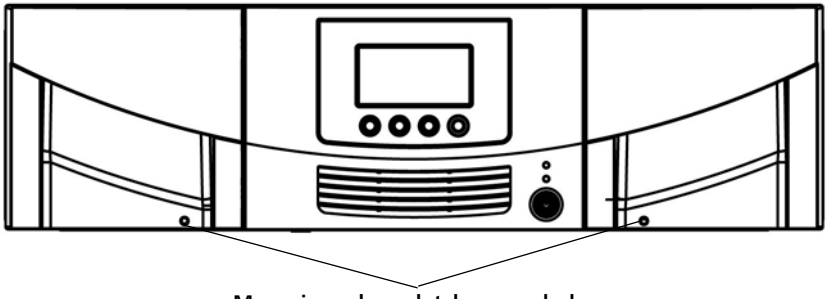
2 Lift the library, place it on the rack shelves, and slide it into the rack as far as it will go.

3 Open one of the magazines slightly to access the captive thumbscrew that is attached to the library chassis. You will use this thumbscrew to secure the library to the rack. To open the magazine, insert the magazine lock override tool into the access hole in the bottom of the magazine bezel (see Figure 39 on page 187). Use the tool to depress the release latch while gently pulling outward on the magazine bezel handle.

   Right-side magazines will only slide out as far as the I/E station (one column of slots). To release the right-side magazines fully:

   - On the Scalar i40 and the bottom right magazine of the Scalar i80, reach under the open magazine and insert the tool directly into the access hole in the library chassis to depress the release latch, while pulling out on the magazine bezel handle.
   - On the top right magazine of the Scalar i80, reach under the open magazine and press the release latch directly with your finger, while pulling out on the magazine bezel handle.

Figure 39 Magazine Release Latch Access Holes

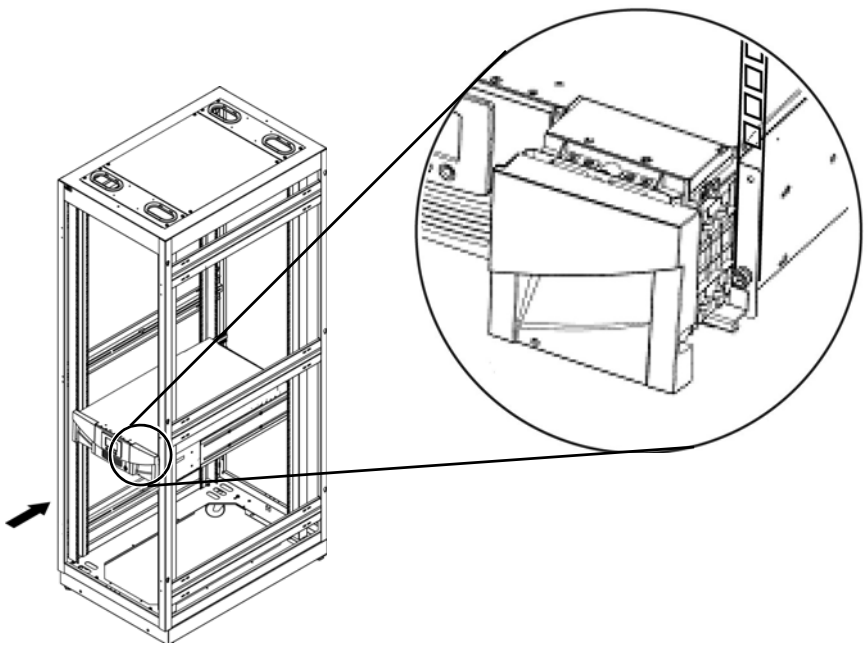


4 Screw the captive thumbscrew finger-tight into the rack (and through the clip nut or cage nut, if installed). See Figure 40 on page 188.

5 Repeat Step 3 and Step 4 for the remaining thumbscrews.

6 Close all the magazines by pushing them in until they click shut.

Figure 40 Securing the Scalar i40 and Scalar i80 in the Rack



Removing the Library From a Rack

WARNING: At least two people are required to lift the library and remove it from a rack.

1. Shut down the library by selecting **Actions > Shutdown** from the operator panel.
2. Turn **OFF** the library by pressing the power button on the front panel.
3. Disconnect the power supply cord, the Ethernet cable, and all tape drive cables from the back of the library. If you have multiple tape drives, label the cables so you can reconnect them to the correct tape drives later.

4 Remove all the tape drives from the library (for details, see Removing and Replacing a Tape Drive on page 231).

5 Remove all the magazines from the library (for details, see Removing and Replacing a Magazine on page 215).

6 Unscrew the captive thumbscrews in the “rack ears” that secure the library to the rack (see Figure 40 on page 188).

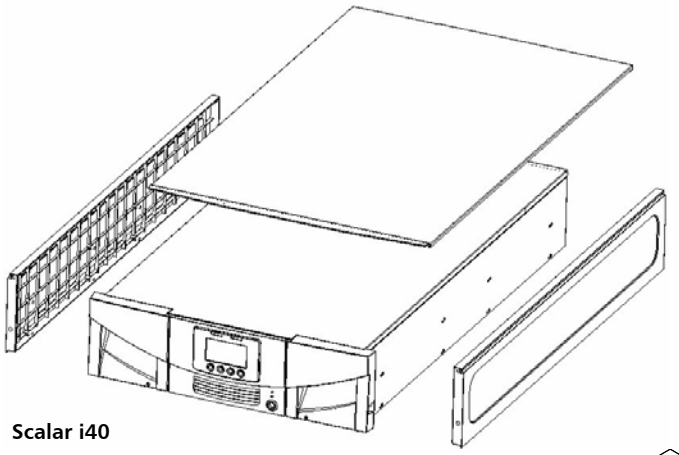
7 Slide the library out of the rack. Keep the library level as you slide it out of the rack.

8 Place the library on a flat, stable surface.

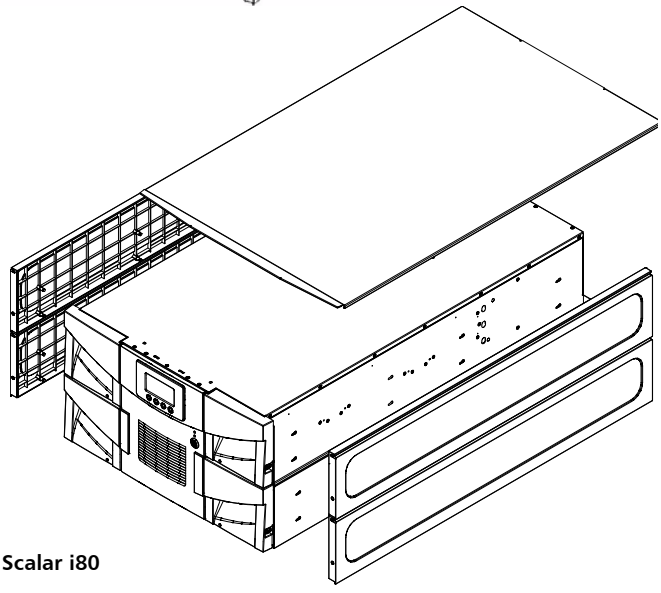
Installing the Library in a Desktop Kit

The instructions for installing the Scalar i40 and the Scalar i80 in a desktop are the same. The only difference is that the Scalar i40 has two side panels, and the Scalar i80 has four.

Figure 41 Desktop Kit, Scalar i40 and Scalar i80

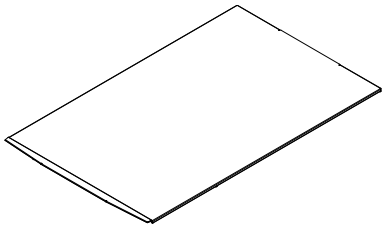
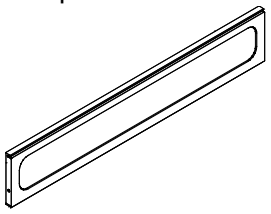


Scalar i40



Scalar i80

Kit Contents

Item	Quantity
Top cover 	1
Side panel 	2 for the Scalar i40; 4 for the Scalar i80
Top cover screws	2
Rubber feet	8

Tools Required

- Phillips screwdriver
- Magazine lock override tool — an opened paperclip, small screwdriver, or other object (3.5 mm or less in diameter that will not break off)

Space Requirements

See the following:

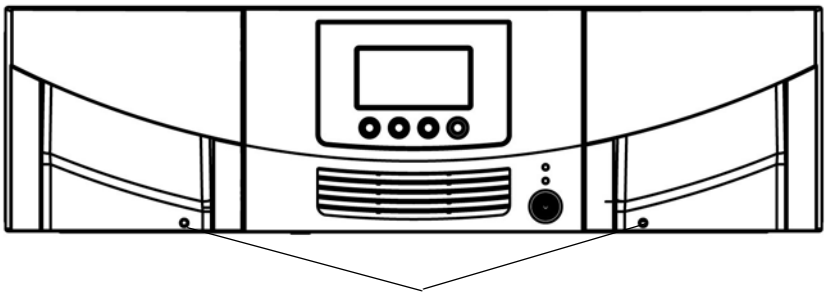
- Physical Specifications on page 269 and
- Air Clearance Requirements on page 271

Procedure

WARNING: Two people are required to safely lift the library.

1. If your library is currently installed in a rack, remove the magazines and tape drives, and then remove the library from the rack. See Removing the Library From a Rack on page 188.
2. Set the library on the desk or table in your chosen location.
3. Remove all the magazines from the library (if you have not already done so), as follows:
   a. Insert the magazine lock override tool into the access hole in the bottom of the magazine bezel (see Figure 42).
   b. Use the tool to depress the release latch while gently pulling outward on the magazine bezel handle. If the magazine is on the right side, it will only slide out as far as the I/E station. To release the magazine fully:
      - On the Scalar i40 and the bottom right magazine of the Scalar i80, reach under the open magazine and insert the tool directly into the access hole in the library chassis to depress the release latch, while pulling out on the magazine bezel handle.
      - On the top right magazine of the Scalar i80, reach under the open magazine and press the release latch directly with your finger, while pulling out on the magazine bezel handle.

Figure 42 Magazine Release Latch Access Holes



4 Look through the magazine slot openings to be sure the robot is resting on the floor of the library. If not, reach inside and gently press down on one of the robot's side metal rods until the robot starts moving. It should drift down to rest on the floor of the library.

5 Turn the library carefully on its side (either the left or right side). Make sure the front end of the library (the "rack ear") overhangs the edge of the table so that the library lies flat.

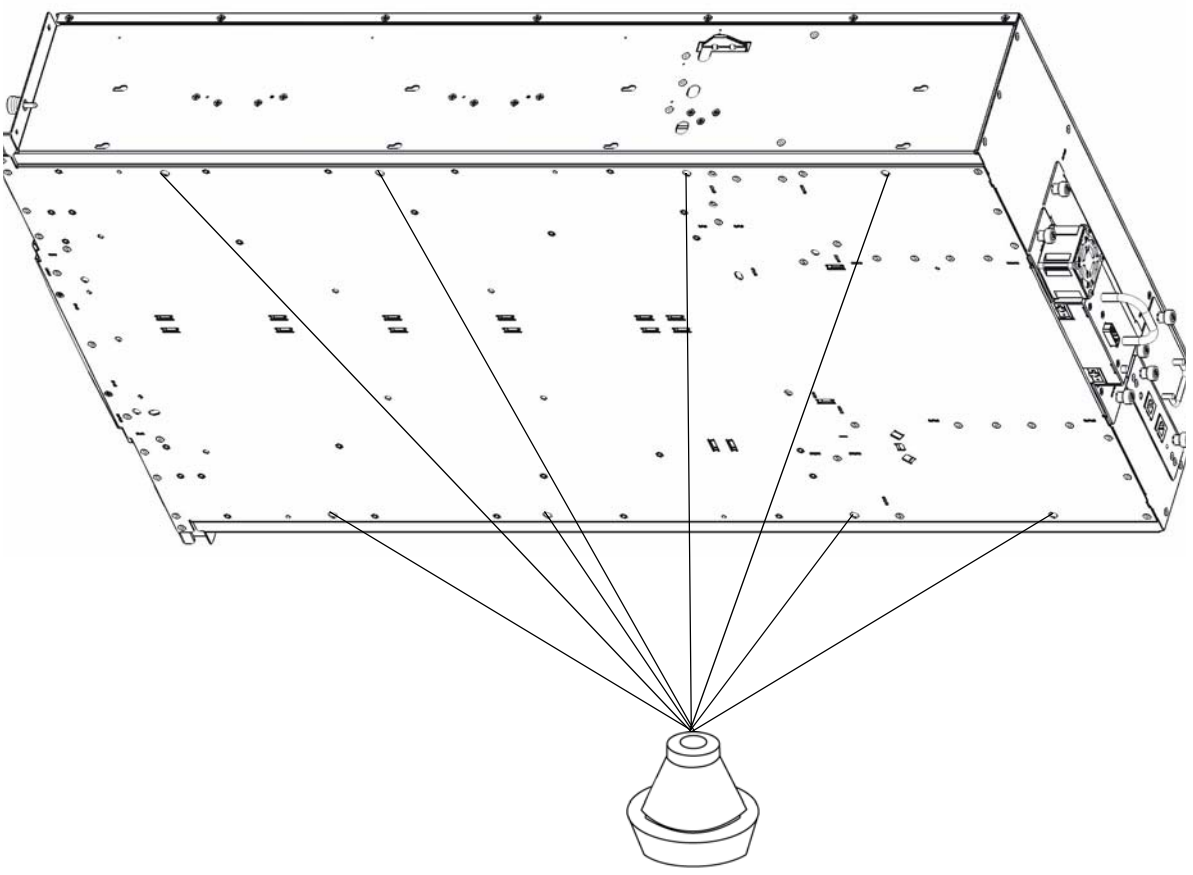
6 Install the eight rubber feet on the bottom of the library, as follows:

   a There are eight holes in the bottom of the library into which you will press the rubber feet. Four holes are located along the right edge and four along the left edge. Figure 43 shows the locations of these holes.

   b Use your fingers to press the feet into the holes. Twisting the feet as you push them may make it easier to get them in. See Figure 43 on page 194.

   c Carefully turn the library back to an upright position so that it is resting on its rubber feet.

Figure 43 Location of Rubber Feet on Bottom of Library



7 Install the side panels one at a time (in any order) as follows (see Figure 44 on page 196):

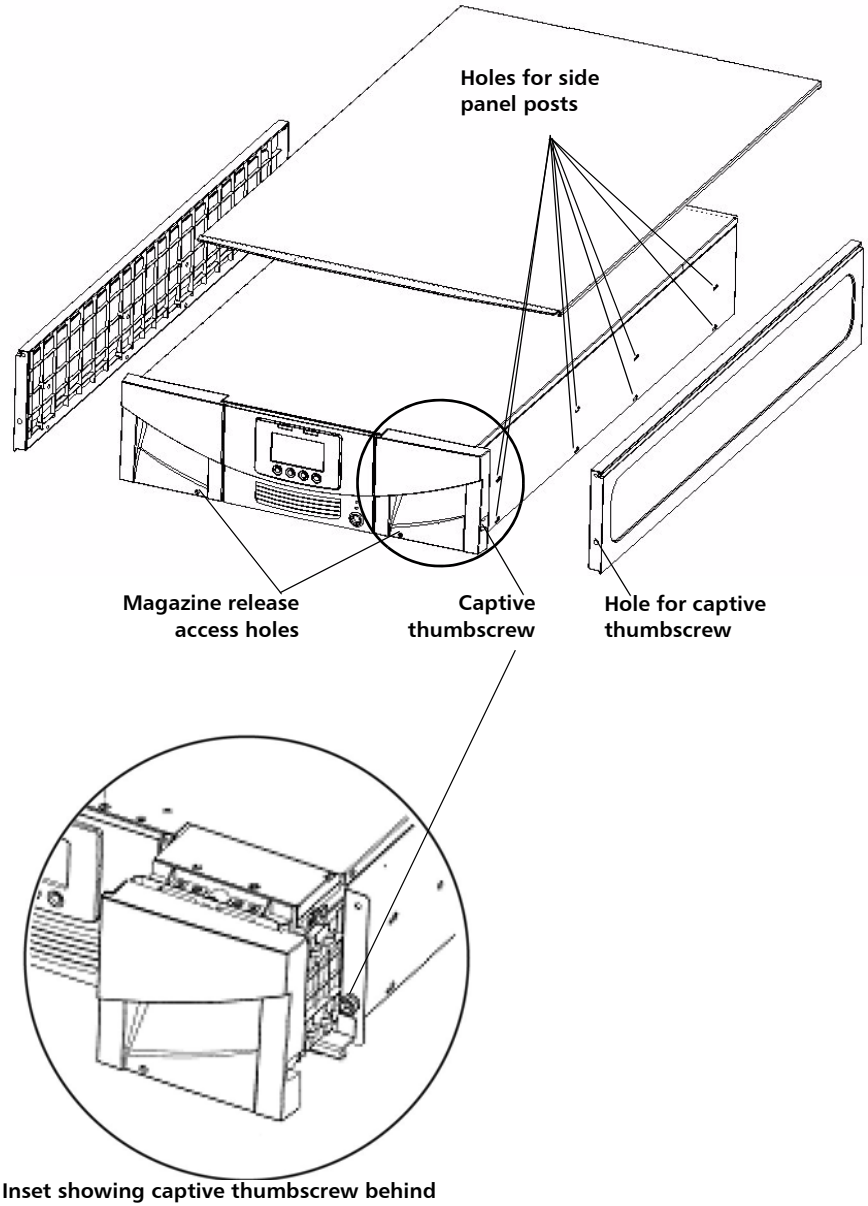
   a Orient the side panel correctly. They are all the same but can only be installed one way. Line up the eight posts on the inside of the side panel with the holes in the side wall of the library. Line up the screw hole in the bottom front of the side panel with the captive thumbscrew behind the magazine on the library chassis.

   b Press the side panel against the wall so that the posts go into the holes.

c Slide the side panel toward the front of the library about half an inch until it stops and the posts are engaged in the holes. The side panel should be flush with the side of the library chassis.

d Tighten the thumbscrew at the front of the library to secure the side panel to the library.

Figure 44 Installing the side panels

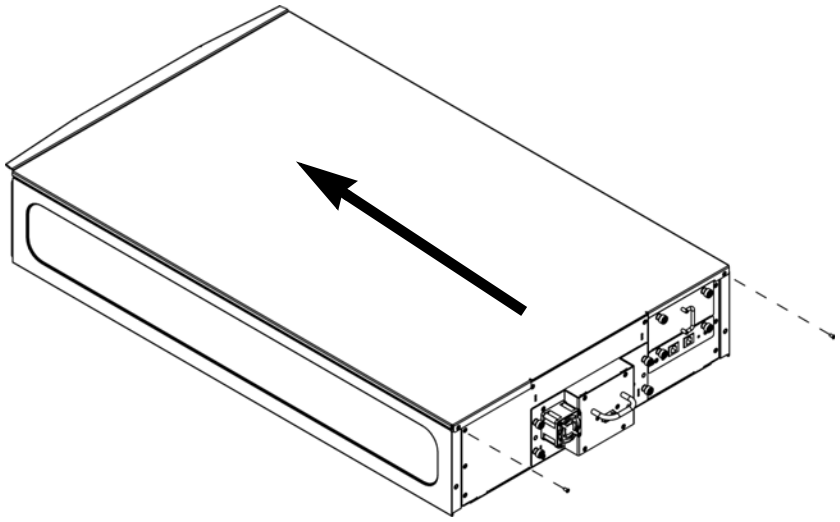

Holes for side panel posts
Magazine release access holes
Captive thumbscrew
Hole for captive thumbscrew
Inset showing captive thumbscrew behind open magazine

8 Install the top cover as follows (see Figure 45):

   a Slide the top cover onto the library, from back to front. The back of the top cover has two screw holes and overhangs the back of the library.

   b Install the two top cover screws through the top cover and into the screw holes in the top of the side panels.

Figure 45 Installing the Top Cover



9 Re-install the magazines and push them in until they close.

10 Re-install tape drives if you removed them previously.

11 Connect the tape drive cables, Ethernet cable, and power cord (see Connecting Library Cables on page 173).

Removing the Library from a Desktop Kit

To remove the library from a desktop kit, reverse the steps in Installing the Library in a Desktop Kit on page 189.

Removing and Replacing the Front Bezel

The procedure is the same for the Scalar® i40 and the Scalar i80. The pictures show the Scalar i40.

You may perform this procedure with library power **ON**. If you do, be careful not to accidentally press the power button and turn the library off when installing the bezel.

Required Tools

- Phillips #1 screwdriver

Bezel Replacement Kit Contents

- 1 Bezel
- 4 screws

Bezel Replacement Procedure

1. Stop all library operations.
2. Open all the magazines in the library a few inches.
   a. On the operator panel, select **Actions > Magazine**.
   b. Select a magazine and press **Release**.
   c. When prompted, pull open the magazine a few inches.
   d. Repeat for all magazines in the library.
3. Prepare to gain access to the bezel screws (see Figure 46 on page 200 and Figure 47 on page 201 for locations). The method depends upon how your library is installed. Follow the instructions in the table below that correspond to your library installation.

If your library is...	Follow these steps...
Installed in a rack high enough to access to the bottom bezel screws	Unscrew all the thumbscrews that secure the library to the rack (the Scalar i40 has two thumbscrews; the Scalar i80 has four). See Figure 47 on page 201.

If your library is...	Follow these steps...
Installed in a desktop kit	Release the desktop cover by removing two screws at rear of the desktop cover, then slide the desktop cover toward the back of the library two or three inches.
Installed very low in a rack so that you cannot access the bottom bezel screws unless you remove the library from the rack	Remove the library from the rack (see Removing the Library From a Rack on page 188).

4 Slide the library one-to-two inches forward out of the rack or over the edge of the table or desk in order to access the two bottom bezel screws.

WARNING: Only slide the library out far enough out to access the two screws on the bottom of the library. The library is not secured in the rack or on the desk. Pulling it out too far could cause the library to slide out of the rack or off the desk.

Caution: Ensure there is enough slack in the power cords and cables connected in the rear of the library so that you do not dislodge them when you slide the library forward.

Caution: Do not tip the library or tilt it on its side.

5 Make sure all the magazines are pulled out a few inches (or removed) to allow you to remove and install the bezel without damaging it.

6 Remove and set aside the two screws securing the bezel to the bottom of the chassis (see Figure 46 on page 200).

7 Remove and set aside the two screws securing the bezel to the top of the chassis (see Figure 47 on page 201).

Figure 46 Bezel Screw Locations on Bottom of Library

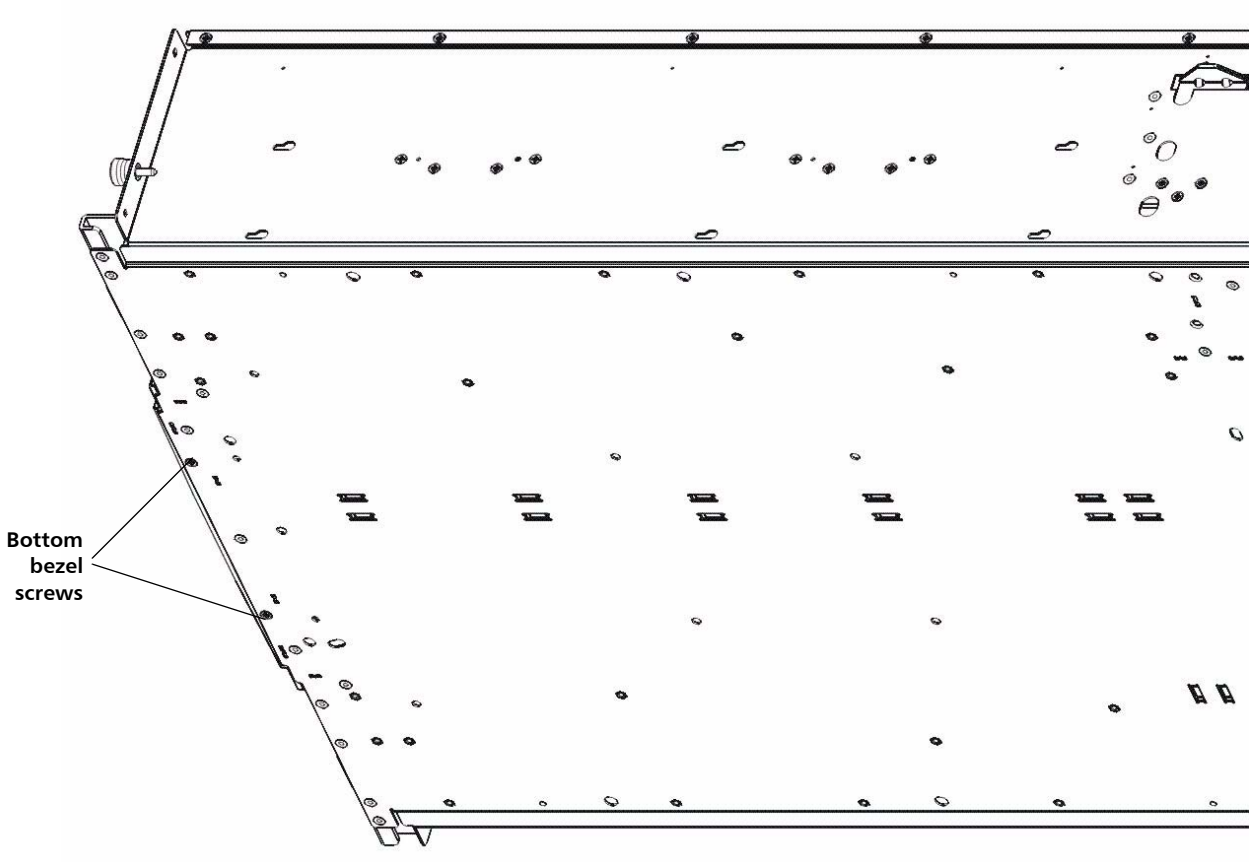
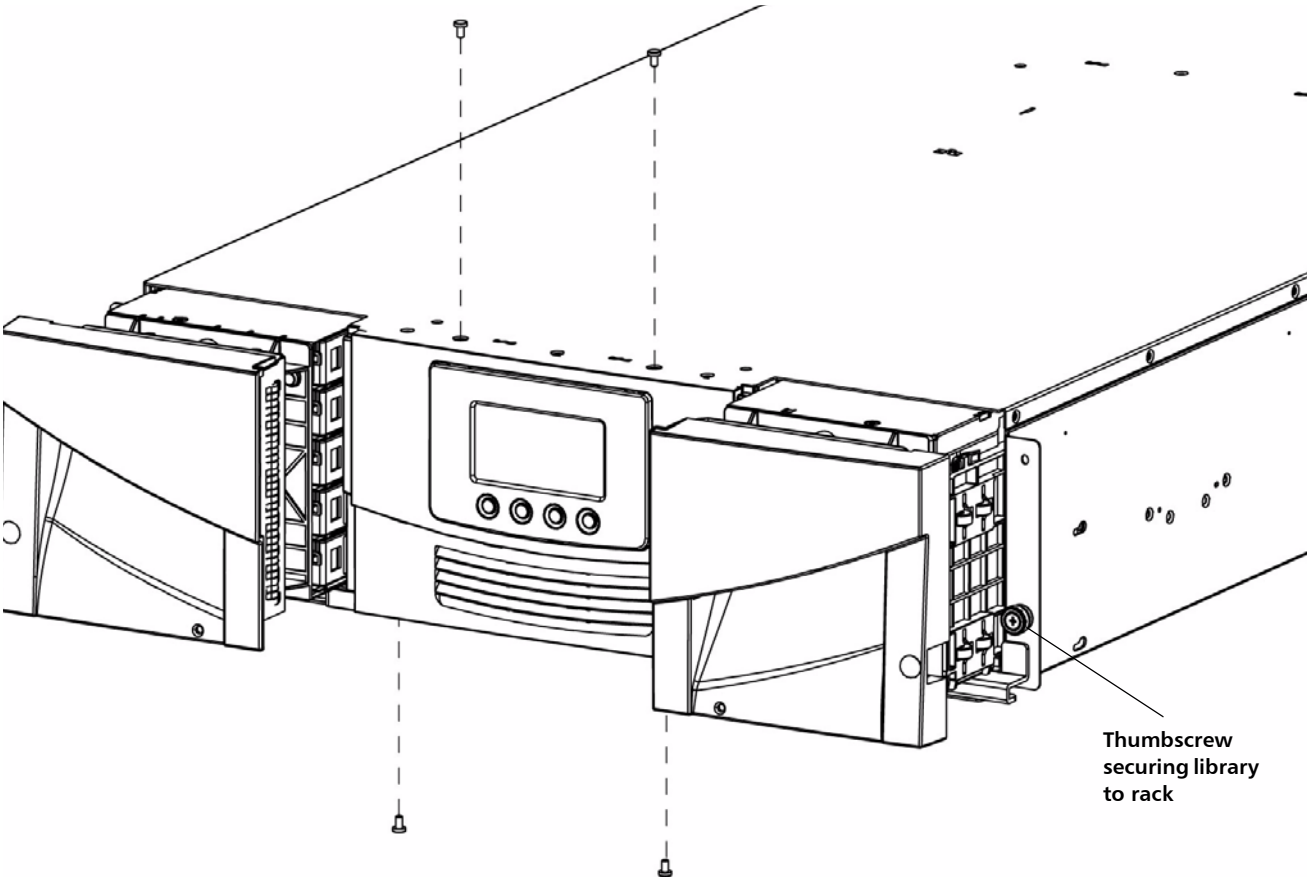


Figure 47 Bezel Screws



8 Pull the bezel straight out and off of the library. Do not tip or twist the bezel as you pull it off.

9 Install the new bezel straight onto the library. Do not tip or twist the bezel. Slide the top and bottom edges of the bezel to the inside of the top and bottom layers of the chassis sheet metal. On the Scalar i80, the bezel will "snap" into place. Install the two top screws, then the two bottom screws.

Caution: Make sure the power button and all four operator panel control buttons appear through the holes in the bezel and are not trapped beneath the bezel.

Caution: Be careful not to accidentally hit the power button and turn the library off while you are installing the bezel.

10 Reinstall the library in the rack or desktop kit.

11 Close all the magazines.

12 If you turned the library off to perform this procedure, turn it **ON** now by pressing the power button on the front panel. Wait until the library initializes before resuming library operations.

13 If you removed the library from the rack to perform this procedure, run the Installation and Verification Test (IVT) to ensure the robot, tape drives, and magazines are all functioning properly. From the operator panel, select **Tools > IVT** and follow the instructions on the screen. The IVT takes about 30 minutes. See Running the Installation and Verification Test (IVT) on page 255 for more information about the IVT.

Removing and Replacing the Chassis

DISCLAIMER: Tests have been conducted on the finished product and have passed Safety Regulatory requirements at time of test.

WARNING: For field/customer replaceable sub-assemblies, all instructions pertaining to further integration and operation verification such as those in this document must be fully complied with. Do not attempt to operate the product before the product is fully assembled and self diagnostics show that the product passes, otherwise serious physical injury may occur to the user. The manufacturer(s) will not be held liable/responsible if such precautions are not adhered to.

WARNING: Two people are required to safely lift the library into and out of its packaging, a rack, or a desktop kit.

When you replace a library chassis, you will remove all the components from your existing library and install them in the new library.

Required Tools

- Phillips #1 screwdriver
- Magazine lock override tool — an opened paperclip, small screwdriver, or other object (3.5 mm or less in diameter that will not break off)

Procedure

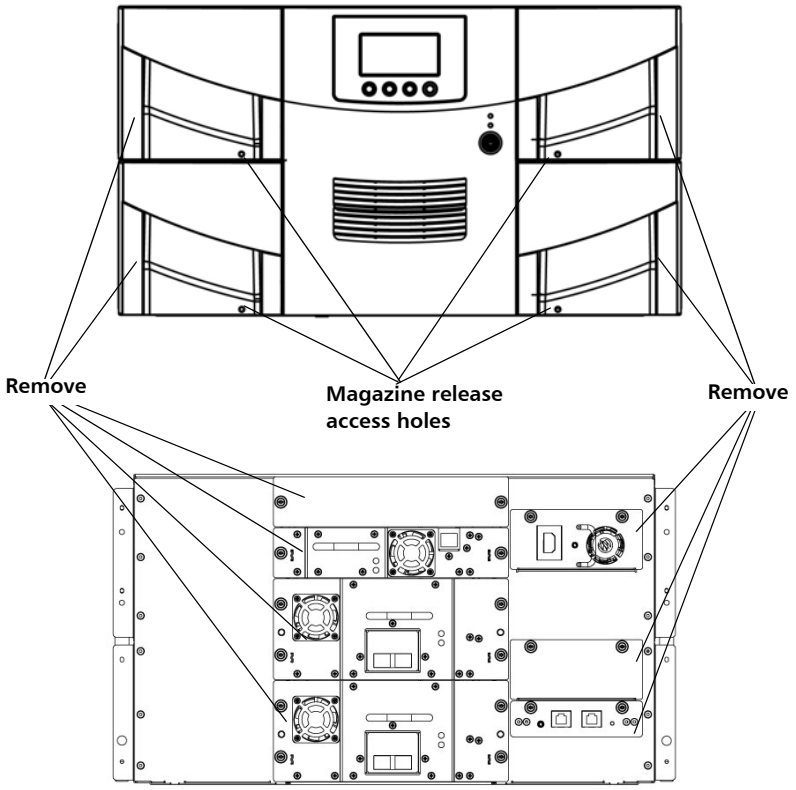
1. Unpack the new library chassis and place it on a flat, level surface.
2. Verify that the new chassis is the same type (Scalar® i40 or Scalar i80) as the unit you are replacing.
3. If you had license keys installed on your library, you will need to install new ones on the replacement library. Contact Quantum Support to request new license keys.
4. If the library you are replacing is still turned on and operational, shut down the library by selecting **Actions > Shutdown** from the operator panel.
5. Turn **OFF** the library by pressing the power button on the front panel.
6. Disconnect the power supply cord, the Ethernet cable, and all tape drive cables from the back of the library. If you have multiple tape drives, label the cables so you can reconnect them to the correct tape drives later.

7 Remove all of the following components from the library (see Figure 48 on page 206).

Component to Remove	Instructions
Power Supplies	**Caution:** Make sure the power supply is unplugged and disconnected from live power before you remove it. **1** Disconnect the power cord from the back of the power supply. **2** Unscrew the captive thumbscrews. **3** Pull outward on the power supply handle to remove it from the library.
System Control Board (SCB)	**1** Loosen the two captive thumbscrews on the SCB. **2** Grip the thumbscrews and pull outward to slide the SCB out of the library. **3** Place the SCB on an anti-static surface or in an anti-static bag.
Tape Drives	**1** Label each tape drive with its location in the library slots. It is recommended that you reinstall the tape drives in the same location in the new chassis. **2** Unscrew the captive thumbscrews securing the tape drive sled to the back of the library. Half-height tape drives have two thumbscrews. Full-height tape drives have four thumbscrews. **3** Using the handle, pull the drive sled out of the library. It should slide out smoothly and easily.
Filler Plates	Remove all filler plates (tape drive and power supply). **1** Unscrew the two captive thumbscrews. **2** Pull the filler plate out.

Component to Remove	Instructions
Magazines	**1** If your library is a Scalar i80, label the magazines so you can reinstall them in the same slots. **2** Insert the magazine lock override tool into the access hole in the bottom of the magazine bezel. **3** Use the tool to depress the release latch while gently pulling outward on the magazine bezel handle. If the magazine is on the right side, it will only slide out as far as the I/E station. To release the magazine fully: • On the Scalar i40 and the bottom right magazine of the Scalar i80, reach under the open magazine and insert the tool directly into the access hole in the library chassis to depress the release latch, while pulling out on the magazine bezel handle. • On the top right magazine of the Scalar i80, reach under the open magazine and press the release latch directly with your finger, while pulling out on the magazine bezel handle.

Figure 48 Components to Remove



8 If the library is in a desktop kit or rack, remove it.

- To remove the library from a rack, unscrew the captive thumbscrews on the front of the library that secure the library to the rack, then slide the library out of the rack. Place the library on a flat, stable surface.

  WARNING: Two people are required to safely lift the library out of a rack.

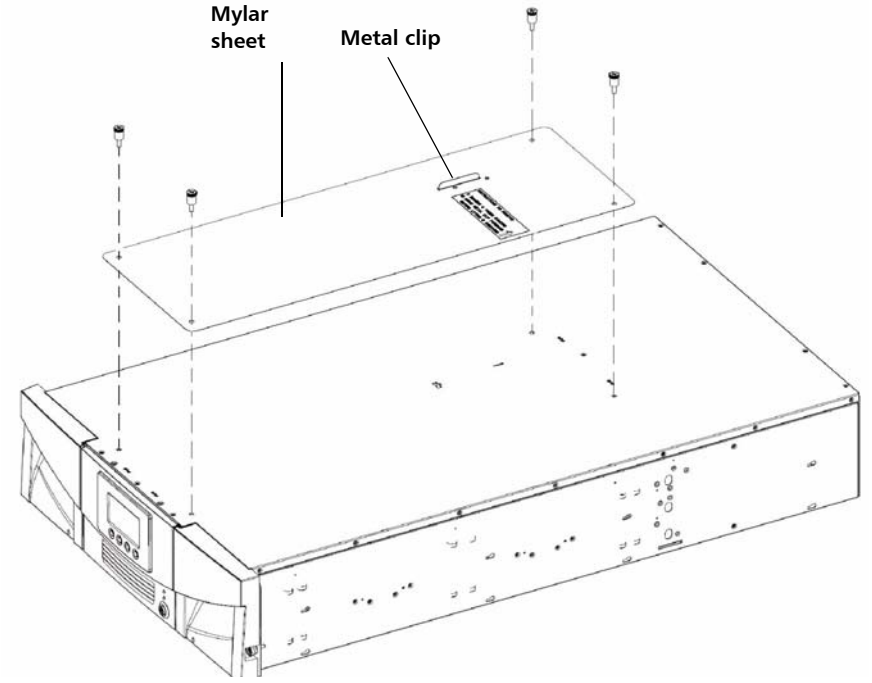
- To remove the library from a desktop kit, remove the two top cover screws at the rear of the top cover. Loosen the captive thumbscrews on the library chassis that are attached to the side panels of the desktop kit. Slide the side panels one-half inch toward the rear of the library to disengage the side-panel posts from the library wall, then pull the side panels off.

Do **NOT** remove the eight rubber "feet" installed on the bottom of the library (you will remove them later, in Step 10, Sub-Step c on page 208, once the library is set on its side).

9 Remove the robot restraint from the replacement chassis following the instructions printed on the restraint (see Figure 49).

- Remove and save the four thumbscrews for use in restraining the robot in the chassis you are returning.
- Discard the mylar sheet and metal clip.

Figure 49 Removing the Robot Restraint



10 Restrain the robot in the chassis being returned as follows (see Figure 50 on page 209):

a Look through the magazine slot openings to be sure the robot is resting on the floor of the library. If not, reach inside and gently press down on one of the robot's side metal rods until the robot starts moving. It should drift down to rest on the floor of the library.

b Turn the library carefully on its side (either the left or right side). Make sure the front end of the library (the "rack ear") overhangs the edge of the table so that the library lies flat.

Caution: Do not turn the library upside down. Do not turn the library more than 90 degrees from upright.

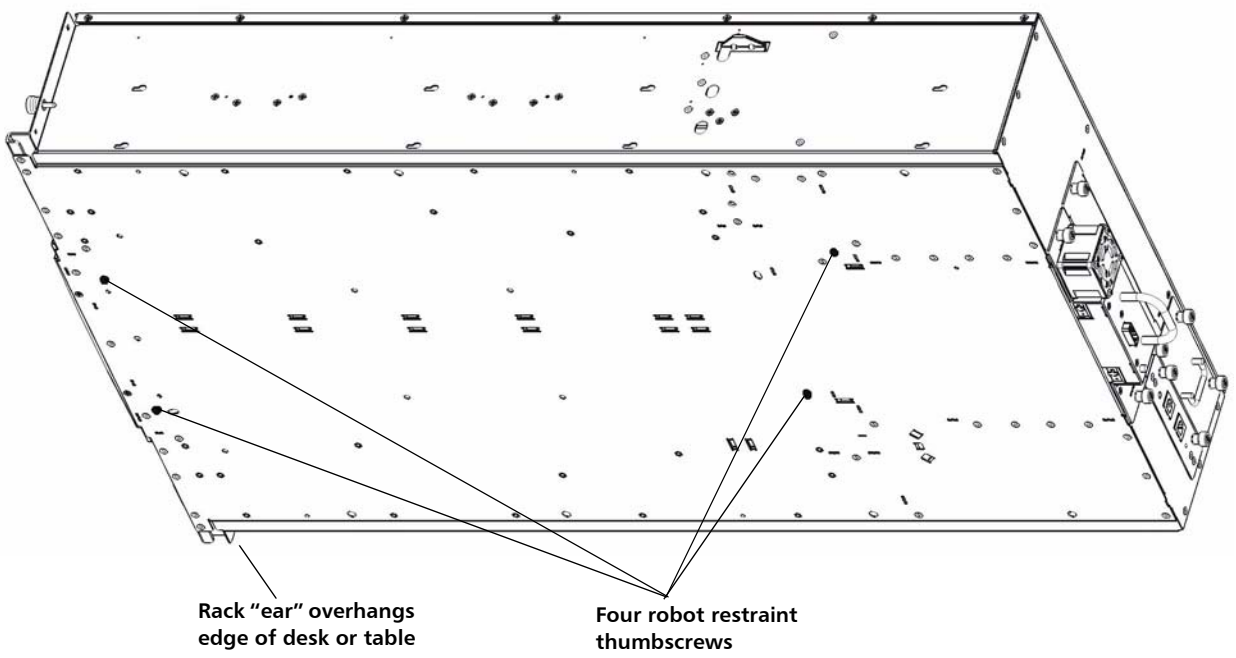
c If your library was installed in a desktop kit, remove the eight rubber "feet" installed on the bottom of the library. You can remove them by twisting them as you pull them out. Save them to use on the replacement chassis.

d Take the four thumbscrews you just removed from the replacement chassis and install them into the floor of the chassis you are returning in the locations shown in Figure 61. They will screw through the robot and secure it in place on the floor of the chassis.

e Do NOT turn the library back to an upright position at this point. Leave it on its side until you place it in the box.

Caution: If you place the library upright with the robot restraint thumbscrews installed, you could damage the chassis or the robot.

Figure 50 Restraining the Robot



11 Install the new chassis in a rack or desktop kit. For instructions, see Installing the Rack Mount Kit (Rail Kit) on page 174 or Installing the Library in a Desktop Kit on page 189.

WARNING: Two people are required to safely lift the library.

12 Install the components you removed from the old chassis into the new chassis.

Component to Install	Instructions
System Control Board (SCB)	Install the SCB **before** you install the power supply. **1** Position the SCB for installation: The board components face up. The flat part of the board faces down. The thumbscrews are on the upper side of the SCB back plate. **2** Install the new SCB by pushing the SCB into the slot until it stops. It should slide smoothly and easily. When it reaches the end of its travel, press firmly on the back panel of the SCB to "snap" it into place. **3** Tighten the two thumbscrews finger tight. **4** Connect the Ethernet cable to the LEFT Ethernet port (as viewed from the back of the library; see Figure 51 on page 212).
Power Supplies	If your library is a Scalar i80 and you have only one power supply, install it in the top slot. If you have two power supplies, install them both. **Caution:** Make sure the power supply is unplugged and disconnected from live power before you install it. **1** Push the power supply straight into the slot. You may need to press firmly on the power supply sheet metal at the very end to plug in the power supply to the connector on the library. You will feel it snap into place. The power supply only goes in one way, and should slide in easily. If you cannot slide it in, you may be trying to install it upside down. **2** Tighten the two thumbscrews finger tight. **3** Connect the power cord to the power supply. **4** Plug the power cord into a grounded AC outlet.

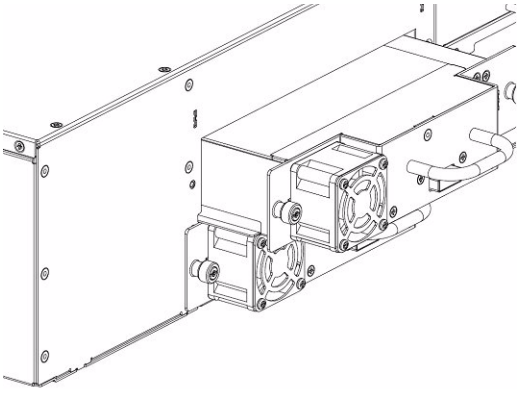
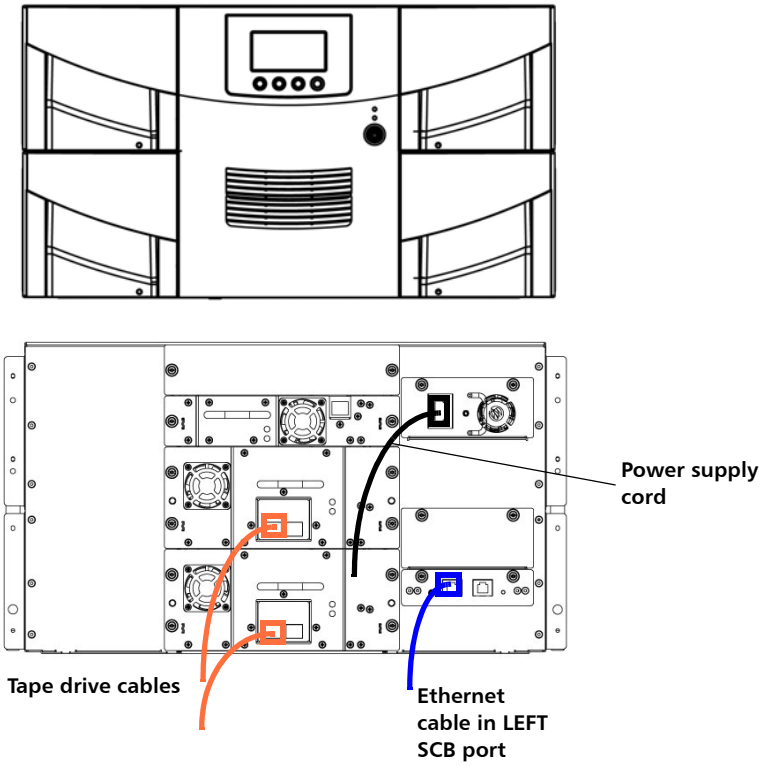
Component to Install	Instructions
Tape Drives	**1** Insert the tape drives into the same drive slots they were in the old chassis. The "shelf" on the bottom of the drive sled fits into the notch in the library chassis and slides on the plastic guide rails. The tape drive must be level to slide in smoothly. At the very end of the slide, you will feel a slight "click" as the tape drive sled connector connects into its mating connector in the library chassis.  **2** Tighten the tape drive's captive thumbscrews finger tight to secure the tape drive to the library chassis. **3** Connect all tape drive cables as they were in the old unit. Make sure they are connected to the host or switch as they were before. For full-height Fibre Channel tape drives, the cable must go in the LEFT connector (as viewed from the back of the library; see Figure 51 on page 212).
Filler Plates	Make sure every empty power supply slot and tape drive slot is covered with a filler plate. **1** Slide the filler plate into the slot. **2** Tighten the thumbscrews.
Magazine	Slide each magazine into its slot and push it in all the way until it stops.

Figure 51 Reinstalled Components



13 Turn **ON** the library by pressing the power button on the front panel.

14 Wait for the library to initialize. This can take up to 5 to 17 minutes, depending on library size.

15 You will notice the library has a new diagnostic ticket (DT042) stating the library's vital product data (VPD) has changed.

16 Reconfigure host applications to support the new library VPD (serial number, WWNN, and drive addresses).

17 If you had license keys installed on the old library, install the new license keys. From the operator panel, select **Setup > License Installation**; or from the Web client, select **Setup > License**. For further directions, see Applying a License Key on page 70.

18 Run the Installation and Verification Test (IVT) to ensure the robot, tape drives, and magazines are all functioning properly. From the

operator panel, select **Tools > IVT** and follow the instructions on the screen. The IVT takes about 30 minutes.

19 Save the library configuration (from the Web client, select **Tools > Save/Restore Configuration** and save the configuration to a known location).

20 Wrap the removed chassis in the antistatic wrapping that contained the replacement chassis. Package the removed chassis using the packaging that contained the replacement chassis. Use the enclosed RMA information to send the chassis back to Quantum.

Removing and Installing a Filler Plate

A filler plate is required to cover every empty tape drive and power supply slot on the rear of the library, in order to maintain proper library cooling. If you remove a tape drive or power supply from the library, you must cover the opening with a filler plate.

There are two types of filler plates:

- Tape drive
- Power supply

Removing and Installing a Tape Drive Filler Plate

The filler plate is half-height in size. If you remove a full-height tape drive, you must install two filler plates to cover the opening.

Removing a tape drive filler plate

1 Unscrew the two captive thumbscrews and pull the filler plate out.

2 Save the filler plate in case you need to use it again.

Installing a tape drive filler plate

- The tape drive filler plate has no “top” or “bottom” orientation – it can go in either way (see Figure 52 on page 215).
- Slide the filler plate into the slot and tighten the thumbscrews.

Removing and Installing a Power Supply Filler Plate

The power supply filler plate is used only on the Scalar® i80 when only one power supply is present.

Removing a power supply filler plate

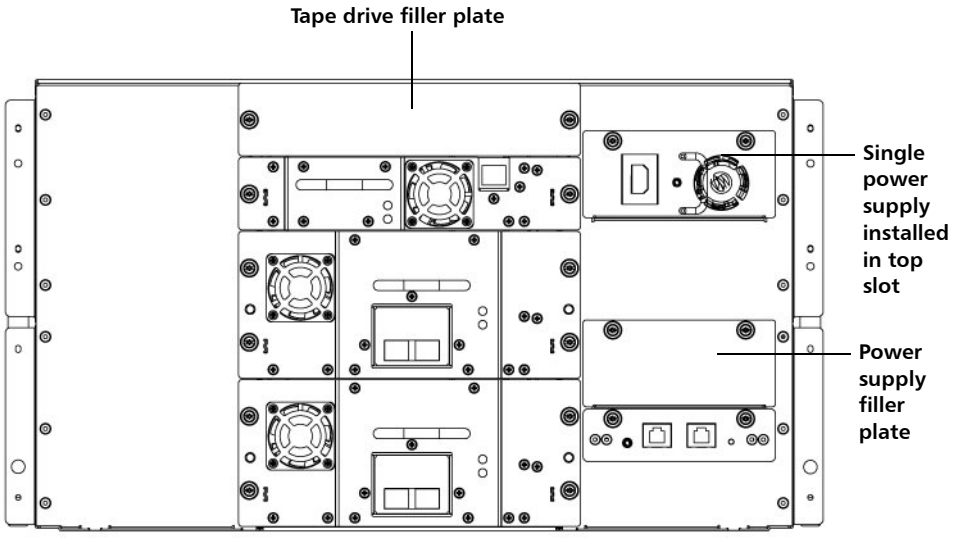
1. Unscrew the two captive thumbscrews.
2. Pull out on the thumbscrews so the filler plate is at a slight angle and the bottom of the filler plate is still attached in the slot.
3. Lift the filler plate up to disengage the catch at the bottom and pull the filler plate out of the slot.

Installing a power supply filler plate:

- On the Scalar i80, if you are using only one power supply, you should install the power supply in the upper slot, and cover the lower slot with a filler plate (see Figure 52 on page 215).

1. Hold the filler plate with the thumbscrews at the top.
2. Insert the bottom edge of the filler plate into the slot, engaging the bottom edge of the filler plate into the bottom of the slot.
3. Pivot the filler plate up to fit securely in the hole.
4. Tighten the thumbscrews.

Figure 52 Filler Plates Installed



Removing and Replacing a Magazine

The procedure for replacing magazines is the same on the Scalar® i40 and the Scalar i80.

Note: The library can operate with one or more magazines uninstalled. However, it will operate at reduced speed.

Required Tools

- Phillips #1 screwdriver

Magazine Replacement Kit Contents

- (1) magazine
- (1) left-side magazine bezel
- (1) right-side magazine bezel

- (4) M3 x 6 Phillips head screws
- (4) washers

Creating a Backup Map of Cartridge Locations

When you transfer tape cartridges from the removed magazine into the replacement magazine, each cartridge needs to go in the same slot position it was in previously. One way to do this is to transfer the cartridges one by one from one magazine to the other. However, if the cartridges get mixed up or dropped, you need a backup method to know where to place your cartridges. The library configuration report provides a convenient backup "map."

1. On the Web client, select **Reports > Library Configuration**.
2. Click the **Show Barcodes** button.

   The screen displays a map of the library showing the location of each cartridge, by barcode.
3. Click the "print" icon in the upper right corner to print the report.

   Alternatively, take a screen capture of the report and save or print it, or copy the map by hand.

Removing the Magazine from the Library

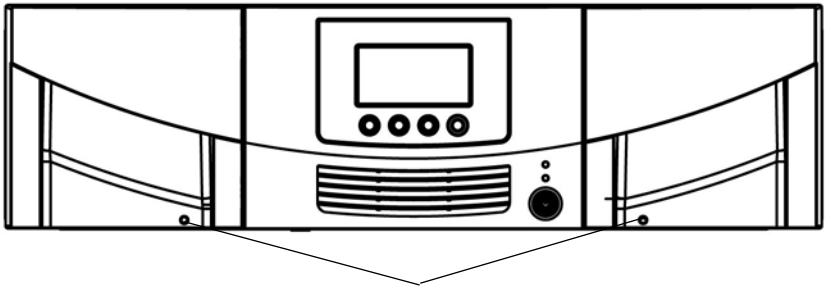
You can perform this procedure with library power on.

1. From the operator panel, select **Actions > Magazine**.
2. Use the **Up** and **Down** buttons to select the magazine you want to remove and press **Release**.
3. Wait for the operator panel to display the message: "Magazine is now unlocked. Waiting for the magazine to be moved to the expected position."
4. Pull the magazine bezel out and remove the magazine from the library. If you do not remove the magazine within 30 seconds, the magazine locks again.

Note: If the library is turned off, you can release the magazine manually by inserting an opened paperclip, small screwdriver, or other object (3.5 mm or less in diameter that will not break off) into the access hole in the bottom of the magazine bezel (see Figure 53). Use the tool to depress the release latch while gently pulling outward on the magazine bezel handle.

Right-side magazines will only slide out as far as the I/E station. To release right-side magazines fully:
- On the Scalar i40 and the bottom right magazine of the Scalar i80, reach under the open magazine and insert the tool directly into the access hole in the library chassis to depress the release latch, while pulling out on the magazine bezel handle.
- On the top right magazine of the Scalar i80, reach under the open magazine and press the release latch directly with your finger, while pulling out on the magazine bezel handle.

Figure 53 Magazine Release Latch Access Holes



Installing the Magazine

The replacement magazine can be used on either the left or right side of the library, depending on how it is oriented. Once it is oriented correctly, the left or right bezel can be attached.

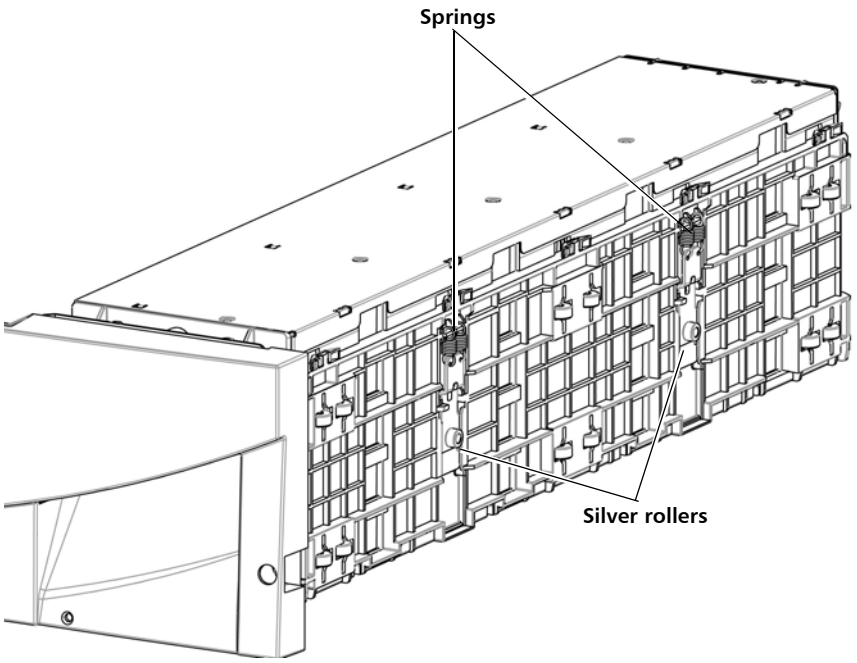
You can perform this procedure with the library powered on.

1 Place the removed magazine in the orientation it would be if it were installed in the library.

2 Place the replacement magazine next to the removed magazine in the same orientation. Make sure they look the same from all angles.

- The storage slots face inward.
- On the outer wall of the magazine, the silver rollers sit below the springs (see Figure 54).

Figure 54 Proper Orientation (Right-Side Magazine)



3 Choose the correct bezel (left or right) from the magazine replacement kit.

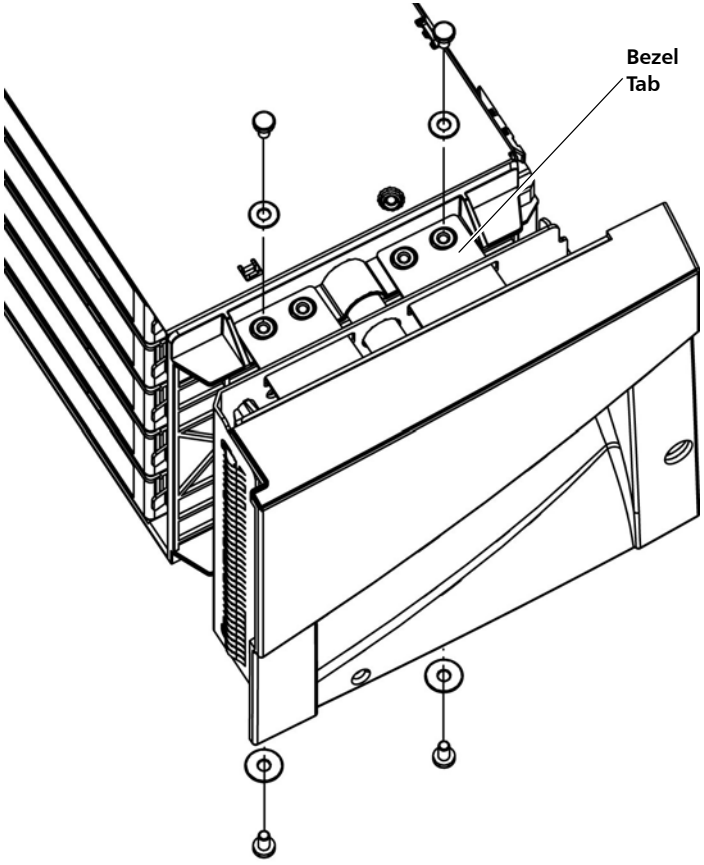
Note: If you try to install the wrong bezel, it will not fit and you will not be able to install it.

4 Push up on the top bezel tabs and fit them over the posts on the top of the magazine. Turn the magazine over and repeat on the bottom (see Figure 55 on page 219).

5 Install the two washers and two M3 screws securing the top of the bezel to the magazine. Install them in the outer hole in each tab (see Figure 55 on page 219).

6 Turn the magazine over and install the two washers and two M3 screws securing the bottom of the bezel to the magazine. Install them in the outer hole in each tab (see Figure 55).

Figure 55 Removing/Installing the Magazine Bezel



7 Remove the tape cartridges from the removed magazine and carefully install them in the exact same slots in the replacement magazine. Use the map you created if necessary.

8 Slide the magazine into the magazine slot all the way until it stops.

The library performs an inventory on the replaced magazine.

9 Wait for the library to finish its inventory.

10 Run the magazine diagnostics test on the replaced magazine to be sure it is functioning correctly.

   a Place a scratch tape in the top I/E station slot.

   b If manual cartridge assignment is enabled, assign the scratch tape to the System partition.

   c From the operator panel, select **Tools > Diagnostics**.

   d Continue through the next few screens to run the magazine test on the replaced magazine.

   If a problem is found during testing, you receive a diagnostic ticket. See Running the IVT Diagnostic Subtests Individually – Robotics, Tape Drive, and Magazine Tests on page 257 more information.

Removing and Installing a Power Supply

The Scalar® i40 contains one power supply. The Scalar i80 can have up to two power supplies for redundancy purposes.

An unused power supply slot must be covered by a filler plate.

This document covers:

- Replacing a Power Supply in a Single-Power-Supply System (Scalar i40 and Scalar i80)
- Adding or Replacing a Redundant Power Supply on the Scalar i80

Figure 56 Single Power Supply System

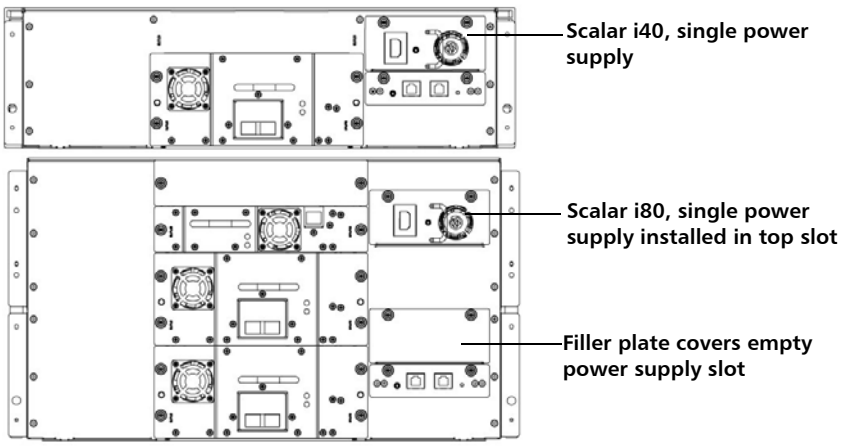
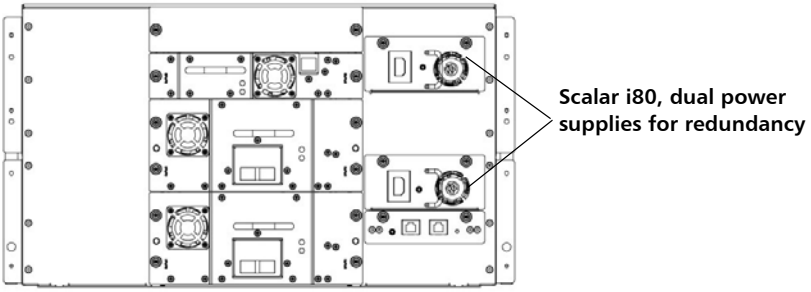

Scalar i40, single power supply
Scalar i80, single power supply installed in top slot
Filler plate covers empty power supply slot

Figure 57 Redundant Power Supply System



Replacing a Power Supply in a Single-Power-Supply System (Scalar i40 and Scalar i80)

Note: If you have a single power supply in a Scalar i80, it is recommended that you install it in the upper slot, to provide better temperature control (see Figure 56).

1. Shut down the library (from the operator panel, select **Actions > Shutdown > Shutdown Library**). Wait for the screen to prompt you to turn off library power.
2. Turn **OFF** library power by pressing the power button on the front panel. Wait for the operator panel screen to turn off.
3. Disconnect the power cord from the power supply.

Caution: Make sure you disconnect live power from the power supply before you remove or install it. Otherwise, damage to the power supply could occur.

4 Unscrew the two captive thumbscrews on the power supply.

5 Using the handle, slowly pull the power supply straight out of the library.

6 Install the new power supply by pushing it straight in to the slot. You may need to press firmly on the power supply sheet metal at the very end to plug in the power supply to the connector on the library. You will feel it snap into place.

The power supply only goes in one way, and should slide in easily. If you cannot slide it in, you may be trying to install it upside down.

7 Tighten the two thumbscrews finger tight.

8 Connect the power cord to the power supply.

9 Make sure the power cord is plugged in to a grounded, AC outlet.

10 The power supply LED should turn amber to indicate it is plugged in but the library is not turned on.

11 Turn **ON** library power by pressing the power button on the front panel.

The power supply LED should turn green immediately to indicate the library is turned on.

If the power supply LED is red, the power supply is not working. Contact Quantum Support.

Adding or Replacing a Redundant Power Supply on the Scalar i80

You do not need to turn off library power to perform this procedure.

1 If you are adding a new power supply to a Scalar i80, remove the filler plate and start at Step 6 below.

2 If you have two power supplies, determine which one to remove.

Caution: Make sure you remove the power supply whose LED is red or off. Do not remove the power supply whose LED is green.

3 Disconnect the power cord from the power supply you want to remove.

Caution: Make sure you disconnect live power from the power supply before you remove or install it. Otherwise, damage to the power supply could occur.

4 Unscrew the two captive thumbscrews on the power supply.

5 Using the handle, slowly pull the power supply straight out of the library.

6 Install the new power supply by pushing it straight in to the space. You may need to press firmly on the power supply sheet metal at the very end to plug in the power supply to the connector on the library. You will feel it snap into place.

The power supply only goes in one way, and should slide in easily. If you cannot slide it in, you may be trying to install it upside down.

7 Tighten the two thumbscrews finger tight.

8 Connect the power cord to the power supply.

9 Make sure the power cord is plugged in to a grounded, AC outlet.

The power supply LED should turn green immediately to indicate the library is turned on.

If the power supply LED is red, the power supply is not working. Contact Quantum Support.

Removing and Replacing the System Control Board

These instructions explain how to remove a system control board (SCB) and replace it with a new one.

The SCB contains your library's network settings, all configurable settings, license keys, and firmware. After you replace the SCB, you must either restore a previously saved configuration, or manually reconfigure the settings and reinstall the license keys.

Note: When you replace the SCB you will permanently lose all data previously collected for logs and reports.

The process steps are:

1. Replacing the System Control Board
2. Installing Library Firmware
3. Restoring the Library Configuration ***or*** Manually Reconfiguring the Library

Replacing the System Control Board

Caution: You must completely remove power from the library before removing and replacing the system control board.

1. If the library is still operational, save the library configuration. From the Web client, select **Tools > Save/Restore Configuration**. Select **Save Configuration** and click **Apply**. Save the configuration to a known location.
2. If the library is still operational, and you want to save log and report information for historical purposes, access the logs and reports you want using the Web client and save them to a known location.
3. If possible, save a library snapshot for future troubleshooting. From the Web client, select **Tools > Capture Snapshot** and follow the instructions.
4. If the library is still operational, shut down the library by selecting **Actions > Shutdown > Shutdown Library** from the operator panel.
5. When prompted, turn **OFF** the library by pressing the power button on the front panel. Wait for all the LEDs on the SCB to turn off.
6. Disconnect the power cords from the power supplies on the back of the library. The Scalar i40 has one power supply. The Scalar i80 may have one or two power supplies. Make sure you remove all power cords.
7. Remove the Ethernet cable from the SCB (see Figure 58 on page 226).
8. Loosen the two captive thumbscrews on the SCB.

9 Grip the thumbscrews and pull outward to slide the SCB out of the library.

10 Remove the new SCB from its packaging. Wrap the old SCB in the antistatic bag that the replacement SCB was wrapped in.

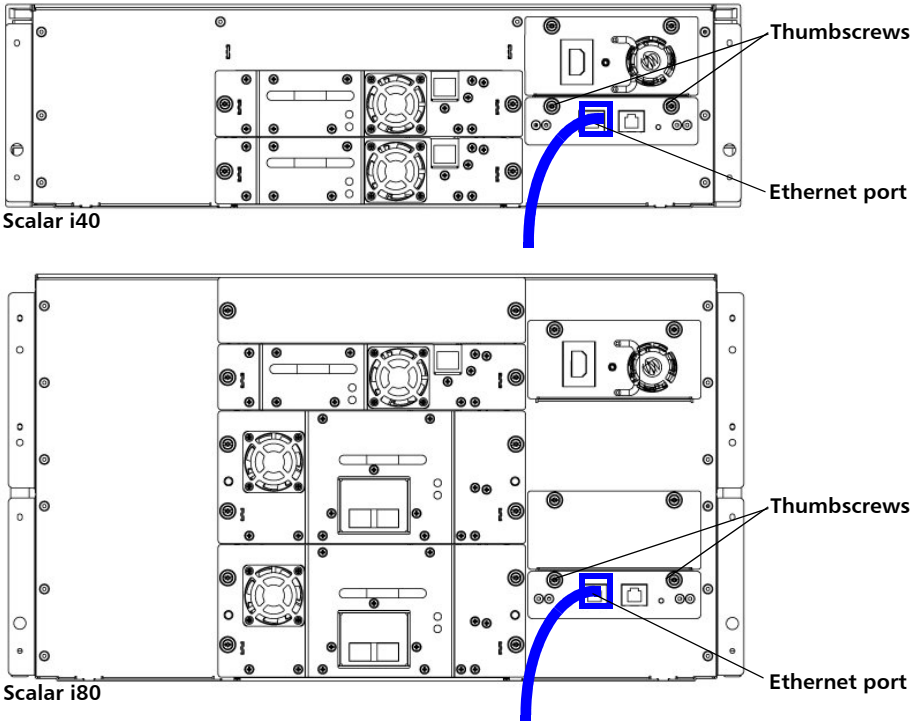
11 Position the new SCB for installation as follows: The board components face up. The flat part of the board faces down. The thumbscrews are on the upper side of the SCB back plate (see Figure 58 on page 226).

12 Install the new SCB by pushing the SCB into the slot until it stops. It should slide smoothly and easily. When it reaches the end of its travel, press firmly on the back panel of the SCB to “snap” it into place.

13 Tighten the two thumbscrews finger tight.

14 Connect the Ethernet cable to the LEFT Ethernet port on the SCB (as viewed from the back of the library; see Figure 58 on page 226).

Figure 58 Ethernet Port Locations on the SCB



15 Continue to Installing Library Firmware on page 226.

Installing Library Firmware

1 Connect the power cords to the power supplies on the back of the library. Make sure that each power supply is plugged in to a grounded, AC outlet.

2 Turn **ON** the library by pressing the power button on the front panel.

The LED on the SCB should illuminate green.

The green power LED on the library front panel above the power button illuminates, and the operator panel screen turns on. The library goes through a connection and initialization sequence that takes up to 60 seconds.

3 When initialization is complete, the **Library Installation** screen appears on the operator panel, displaying the text, "The library needs to have its IP Address configured." The purpose of this screen is to set the IP address so you can access the library via the Web client and download firmware. (After you have loaded firmware, you can change or reconfigure IP addresses if needed.)

4 Press **Next**.

The screen displays the text, "Current protocol: IPv4. Set protocol to IPv6?"

5 Select **Yes** or **No**.

- If you select **Yes**, the library assigns an IPv6 address.
- If you select **No**, you are prompted to select DHCP or assign a static IP address. If you choose to assign a static IP address, use the **Up** and **Down** buttons to set the numeric value for each digit, and press the **Right** button to go to the next digit. When finished, press **Apply**. If you choose DHCP, the library assigns an IPv4 address.

6 When finished viewing or setting the IP address, press **Next**.

The newly assigned IP address displays on the screen.

7 Take note of the IP address.

8 Download the latest library firmware to a known location on your computer. Library firmware is available at http://www.quantum.com. Navigate to the appropriate firmware version and download the firmware image file.

9 Open an Internet session and enter the library IP address listed on the operator panel into the Web browser.

The Web client displays a screen instructing you to select the firmware image you want to load on the library.

10 Click **Browse** and select the firmware image you downloaded to install on the library.

11 Click **OK**, then click **OK** again to agree to restart the library.

The Web client displays the following message:

```
Decoding installation bundle...done.
Validating bundle...good.
Installing firmware...library will reboot when complete.
```

12 Go to the operator panel and wait until the Setup Wizard appears on the screen. The Setup Wizard screen may take up to 20 minutes to appear.

13 Continue as follows:

- If you have saved a library configuration that you want to restore on the library, go to: Restoring the Library Configuration on page 228.
- If you do NOT have a saved library configuration to restore on the library, go to: Manually Reconfiguring the Library on page 229.

Restoring the Library Configuration

Follow the instructions in this section if you have a saved library configuration that you want to reinstall on the library.

1 On the operator panel, press **Cancel** to exit the Setup Wizard.

2 Take note of the library's IP address (on the operator panel, select **Reports > Network Settings**).

3 Access the Web client using the IP address and log in using the default user name and password:

- User name: **admin**
- Password: **password**

Note: Once you restore the configuration, all your former user names and passwords are restored.

4 Restore the configuration using the Web client as follows:

a Select **Tools > Save/Restore Configuration**.

b Select **Restore System Configuration**.

c Click **Browse**. Navigate to the saved configuration and click **Open**.

d Click **Apply**

e Click **OK**.

Note: Restoring the configuration does NOT restore your network settings.

5 Check the library's date, time, and time zone settings and reconfigure if necessary. From the Web client, select **Setup > Date & Time**.

6 If you changed the IP address from what it was originally, update host and other applications that access the library.

7 Save the library configuration. From the Web client, select **Tools > Save/Restore Configuration**. Select **Save Configuration** and click **Apply**. Save the configuration to a known location.

8 It is recommended that you run the Installation and Verification Test (IVT). From the operator panel, select **Tools > IVT** and follow the instructions. The IVT takes about 30 minutes. If any problems are detected, the library issues a diagnostic ticket.

9 Package the old SCB in the packaging that shipped with the new SCB and send the old SCB back to Quantum.

Manually Reconfiguring the Library

Follow the instructions in this section if you do not have a saved library configuration.

1 If you had licenses installed on your library, have the license keys handy so you can install them on the library. If you no longer have them, you can obtain them at http://www.quantum.com/licensekeys, or from Quantum Support.

2 When the firmware update is complete, the Setup Wizard appears on the operator panel screen. The Setup Wizard helps you configure the date, time, IP address, IPv6 enable/disable, licenses, partitions, I/E slots, and cleaning slots.

3 Complete the Setup Wizard on the operator panel. If you make a mistake or do not complete all the screens, you can change the configuration later using the operator panel or Web client **Setup** menus.

Note: You cannot update the library name or time zone on the operator panel. If the displayed library name or time zone is incorrect, change it later using the Web client (see Step 8 on page 230).

4 Take note of the library's IP address (on the operator panel, select **Reports > Network Settings**).

5 Access the Web client using the IP address and log in using the default user name and password:

- User name: **admin**
- Password: **password**

6 Optionally, install tape drive firmware for autoleveling. The library firmware contains baseline tape drive firmware for autoleveling. Verify your tape drive firmware is at the level you expect. If not:

a Upload the tape drive firmware you want to use. From the Web client, select **Tools > Drive Operations > Upload/remove tape drive firmware for autoleveling**.

b Unload all tape cartridges from the tape drives on which you want to autolevel firmware.

c Initiate autoleveling by doing one of the following:

- Restart the library (from the operator panel, select **Actions > Shutdown > Restart Library**.
- Restart all the tape drives you want to autolevel, as follows: From the Web client, select **Tools > Diagnostics**. Confirm you want to take the partitions offline. Select **Drives > Drive Tests > Drive Reset**. Select the applicable partitions and tape drives, then click **Apply**, then click **OK**.

7 If you changed the IP address from what it was originally, update host and other applications that access the library.

8 Update the library name, time zone, and any other configuration settings, if required, using the Web client **Setup** menus.

9 Save the library configuration. From the Web client, select **Tools > Save/Restore Configuration**. Select **Save Configuration** and click **Apply**. Save the configuration to a known location.

10 It is recommended that you run the Installation and Verification Test (IVT). From the operator panel, select **Tools > IVT** and follow the instructions. The IVT takes about 30 minutes. If any problems are detected, the library issues a diagnostic ticket.

11 Package the old SCB in the packaging that shipped with the new SCB and send the old SCB back to Quantum.

Removing and Replacing a Tape Drive

It is recommended that you remove and install tape drives with library power **ON** — it is faster and keeps non-affected tape drives and partitions active.

The tape drive always resides in a drive sled, and together they are effectively one unit. If you order a new or replacement tape drive, it will already be installed in a sled.

Caution: Do not remove the tape drive from the drive sled.

Note: For multiple tape drive installs in which you are changing control paths, install and verify the tape drives one at a time, rather than all at once.

Preparing Partitions and Control Paths

Depending on the types of tape drives you are removing and installing, you may need to reconfigure library partitions or change the control path before you remove and replace the tape drive. There are four different types of installation, described in the table below. Follow the instructions in the table before proceeding to the remove/install procedures.

Type of Installation	Instructions
Adding a new tape drive	No special instructions.
Replacing a tape drive that is not assigned to a partition	No special instructions.

Type of Installation	Instructions
Replacing tape drive that is assigned to a partition with a tape drive that has the **same:** • interface type (Fibre Channel or SAS), ***and*** • form factor (half-height or full-height), ***and*** • vendor	Install the replacement tape drive in the same slot as the removed tape drive. There are no special instructions unless the tape drive you are replacing is the control path in a partition with multiple tape drives, and you want the partition to remain online during the replacement procedure. In this case, select another tape drive as the control path. From the Web client, use the **Setup > Control Path** menu path.
Replacing a tape drive that is assigned to a partition with a tape drive that has a **different**: • interface type (Fibre Channel or SAS), ***or*** • form factor (half-height or full-height), ***or*** • vendor	• If the partition contains only one tape drive, delete the partition before removing the tape drive and then re-create the partition once you install the replacement tape drive. • If the partition contains multiple tape drives and the tape drive you want to replace is **not** the control path, delete the tape drive from the partition. • If the partition contains multiple tape drives and the tape drive you want to replace **is the control path**, select another tape drive as the control path. Then delete the tape drive you want to replace from the partition. To delete tape drives from partitions, select **Setup > Partitions** from the Web client. To modify the control path, select **Setup > Control Path** from the Web client.

Removing a Tape Drive from the Library

Caution: Do not remove a tape drive that is currently performing an operation.

1. Make sure the tape drive you want to remove is empty of media. From the operator panel, select **Actions > Tape Drive > Unload**.
2. Take the tape drive you want to remove offline. From the operator panel, select **Actions > Tape Drive > Change Mode**. Select the tape drive and press **Modify**. Press the **Down** button to select **Offline**, then press **Apply**.
3. Disconnect the cable from the back of the tape drive.

4 Unscrew the captive thumbscrews securing the drive sled to the back of the library. Half-height tape drives have two thumbscrews. Full-height tape drives have four thumbscrews.

5 Using the handle, pull the drive sled out of the library. It should slide out smoothly and easily.

6 Wait at least 10 seconds before installing a replacement tape drive to allow the library to recognize that the tape drive has been removed.

7 Install a replacement tape drive following the instructions below. If any empty slots remain, install a filler plate in the empty slot.

8 If you are returning the tape drive to Quantum, wrap it in the antistatic bag in which the replacement tape drive is wrapped, then finish packing it in the same packaging materials from the replacement tape drive. Ship the tape drive to Quantum using the RMA materials included in the packaging.

Installing a Tape Drive

Tape Drive Slot Location Considerations

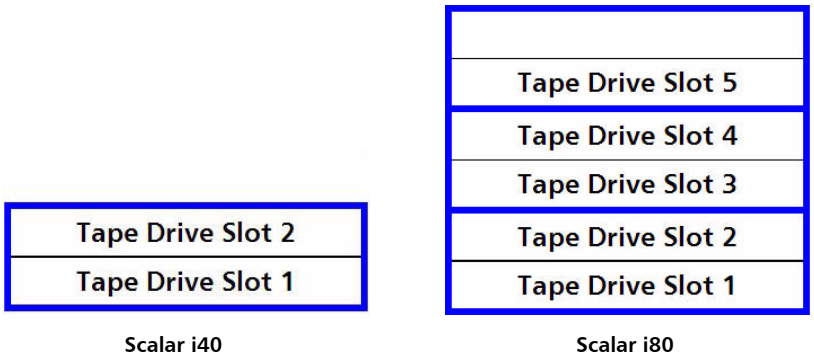
Tape drives can only fit in certain slots, as described below and illustrated in Figure 59. Slots are numbered starting from the bottom and moving up.

- **Scalar i40:** Half-height tape drives can be installed in slots 1 and 2. A full-height tape drive can be installed in slot 1.
- **Scalar i80:** Half-height tape drives can be installed in slots 1, 2, 3, 4, and 5. Full-height tape drives can be installed in slots 1, 3, and 5. The extra space where slot 6 would be cannot hold a half-height tape drive, but will accommodate a full-height tape drive installed in slot 5.

If possible, it is recommended to start installing the tape drives at the bottom slot and work up, without leaving spaces between.

If you are replacing an existing tape drive with a tape drive of the same interface type, form factor, and vendor, place the replacement tape drive in the same slot as the removed tape drive.

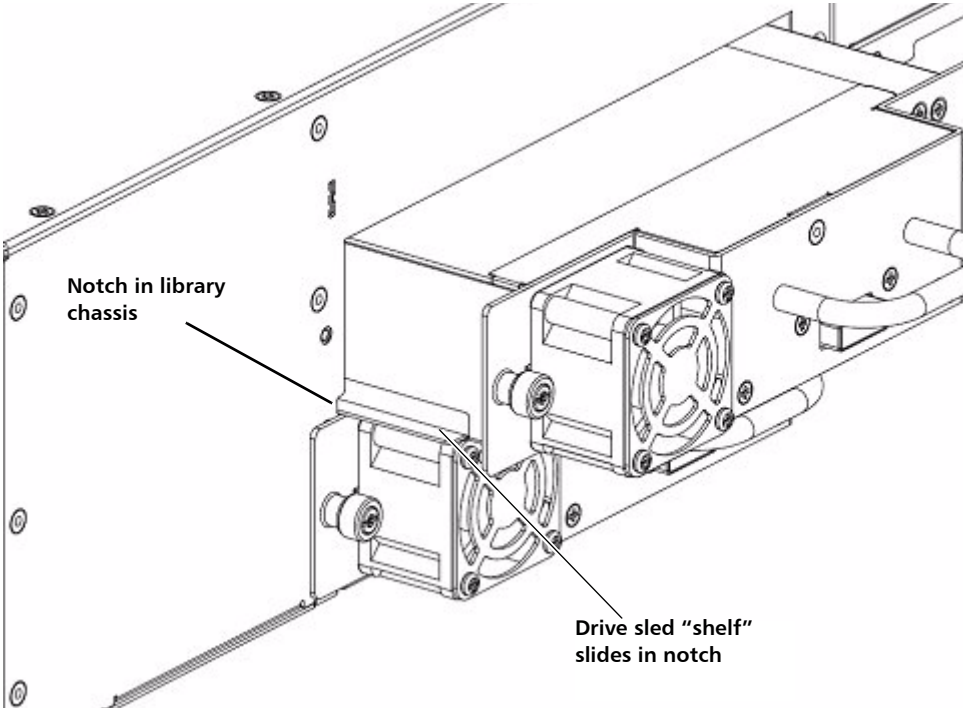
Figure 59 Acceptable Installation Locations for Full-Height Tape Drives



Installation Procedure

1. If you need to remove one or more filler plates, unscrew the two thumbscrews securing the filler plate to the back of the library. Holding the thumbscrews, pull the filler plate gently out of the library. Save the filler plate in case you need to use it in the future.
2. Insert the tape drive into the drive slot. The "shelf" on the bottom of the drive sled fits into the notch in the library chassis and slides on the plastic guide rails (see Figure 60 on page 235). The tape drive must be level to slide in smoothly. At the very end of the slide, you will feel a slight "click" as the tape drive sled connector connects into its mating connector in the library chassis.

Figure 60 Installing a Tape Drive



3 Tighten the tape drive's captive thumbscrews finger tight to secure the tape drive to the library chassis.

   The tape drive LED illuminates red for up to 30 seconds. Then the tape drive fan starts and the LED turns amber, indicating the tape drive is offline. If this is a new installation (not a replacement), the tape drive will come online automatically.

4 Connect the tape drive cable from the tape drive to the host.

5 If the firmware on the newly installed tape drive is different from the standard configured on the library, the library will automatically autolevel the new tape drive's firmware upon installation (for more information, see Updating and Autoleveling Tape Drive Firmware on page 164).

   Autoleveling takes about 7 minutes. A message appears on the operator panel indicating autoleveling is taking place.

   If autoleveling is not required, the tape drive takes about 2 minutes to come ready.

6 If needed, add the new tape drive to an existing partition or create a new partition for it. From the Web client, select **Setup > Partitions** and complete the necessary screens.

7 Bring the tape drive online, if it is not online already. From the operator panel, select **Actions > Tape Drive > Change Mode**. Select the tape drive you want to bring online and press **Modify**. Use the **Up** and **Down** buttons to change the mode to **Online**, then press **Apply**.

   The tape drive LED turns green.

8 Verify the installation by reviewing the library configuration report on the Web client (**Reports > Library Configuration**). Make sure that the new drive is online, in the correct partition, and has the control path status that you want. You may need to refresh your Internet browser.

9 Verify that the host computer and backup applications can see the new tape drive configuration correctly.

10 If any empty slots remain, install a filler plate in the empty slot.

Caution:	Filler plates are required to maintain proper library cooling. Do not run the library with uncovered slots.

11 Run the tape drive diagnostic test on the newly installed tape drive to be sure it is functioning correctly.

   a Install a scratch tape in the top I/E station slot.

   b If manual cartridge assignment is enabled, assign the scratch tape to the System partition.

   c From the operator panel, select **Tools > Diagnostics**.

   d Continue through the next few screens to run the tape drive test on the replaced tape drive.

   If a problem is found during testing, you receive a diagnostic ticket. See Running the IVT Diagnostic Subtests Individually – Robotics, Tape Drive, and Magazine Tests on page 257 for more information.

12 Save the library configuration (see Saving the Library Configuration on page 101).

Packaging the Library for Moving or Shipping

Packaging Kit Contents

- Shipping box
- Top foam
- Bottom foam
- Anti-static wrapping
- (4) M5 Thumbscrews to restrain robot

Creating a Backup Map of Cartridge Locations

You must remove all the tape cartridges before shipping the library. If you want to maintain the same partitions and magazine slot assignments in your new location as you are using currently, you will want to reinstall your tape cartridges in the same slots they are in now. The library configuration report provides a convenient "map" of your slot assignments. If you print or copy this map, you will be able to easily install your cartridges later.

1. On the Web client, select **Reports > Library Configuration**.
2. Click the **Show Barcodes** button.

   The screen displays a map of the library showing the partitions and the location of each cartridge, by barcode.
3. Click the "print" icon in the upper right corner to print the report.

   Alternatively, take a screen capture of the report and save or print it, or copy the map by hand.

Procedure

1. As a precautionary measure, save the library configuration: From the Web client, select **Tools > Save/Restore Configuration**. Select **Save System Configuration** and click **Apply**. When prompted, save the file to a known location on your computer.
2. Stop all library and host operations.

3 Remove the magazines from the library:

   a From the operator panel, select **Actions > Magazine**.

   b Use the **Up** and **Down** buttons to select the magazine you want to remove and press **Release**.

   c Wait for the operator panel to display the message: "Magazine is now unlocked. Waiting for the magazine to be moved to the expected position."

   d Pull the magazine bezel out and remove the magazine from the library. If you do not remove the magazine within 30 seconds, the magazine locks again.

   e Repeat for all magazines in the library.

Caution: Do not put your hands or any other objects into the magazine openings while library power is on.

4 Remove all the tape cartridges from the magazines.

5 Shut down the library by selecting **Actions > Shutdown** from the operator panel. Wait for the operator panel to prompt you to turn off library power.

6 Turn **OFF** the library by pressing the power button on the front panel. Wait for the LED on the SCB to turn off.

7 Disconnect the power supply cord, the Ethernet cable, and all tape drive cables from the back of the library. If you have multiple tape drives, label the cables so you can reconnect them to the correct ones later.

8 If the library is in a rack or desktop kit, remove it.

   - **To remove the library from a rack:**

      a Remove all the tape drives from the library. Label tape drives so you know what order to reinstall them later. They must be reinstalled in the same slots as they were previously. Unscrew the thumbscrews and pull the tape drive handle to remove the drive from the library.

      b Unscrew the captive thumbscrews on the front of the library that secure the library to the rack, then slide the library out of the rack. Place the library on a flat, stable surface.

WARNING: Two people are required to safely remove the library from the rack.

- **To remove the library from a desktop kit,** remove the two top cover screws. Loosen the captive thumbscrews on the library chassis that are attached to the side panels of the desktop kit. Slide the side panels one inch toward the rear of the library, then pull the side panels off.

9 Make sure the robot is sitting on the floor of the library as follows: Look inside the library through one of the magazine openings. If the robot is not sitting on the floor of the library, reach inside and gently press down on one of the robot's metal side rods until the robot starts moving. It should drift down to rest on the floor of the library.

10 Reinstall the empty magazines in the library by pushing them in until they stop.

11 If you removed the tape drives earlier, reinstall them in their proper slots. Push them carefully into their slots and tighten the captive thumbscrews.

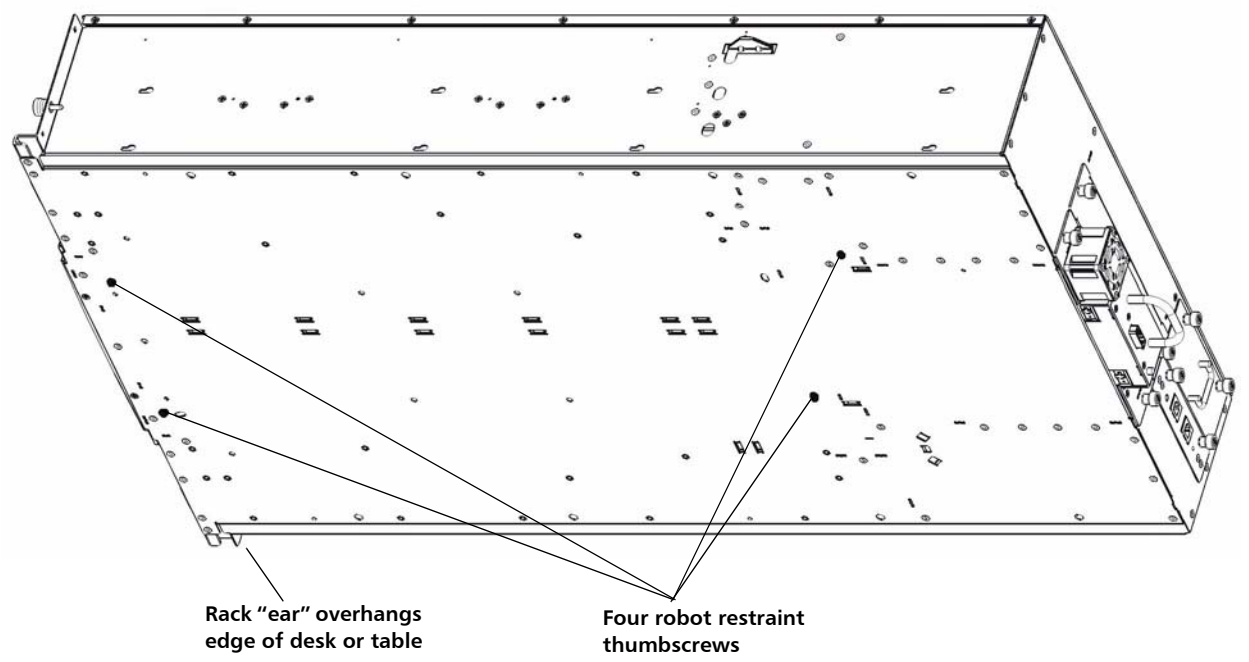
12 Restrain the robot as follows (see Figure 61 on page 240):

a Turn the library carefully on its side (either the left or right side). Make sure the front end of the library (the "rack ear") overhangs the edge of the table so that the library lies flat.

Caution: Do not turn the library upside down. Do not turn the library more than 90 degrees from upright.

b Install four thumbscrews into the floor of the library in the locations shown in Figure 61 on page 240. They will screw through the robot and hold it in place on the floor of the library.

Figure 61 Restraining the Robot



c Do NOT turn the library back to an upright position at this point. Leave it on its side until you place it in the box.

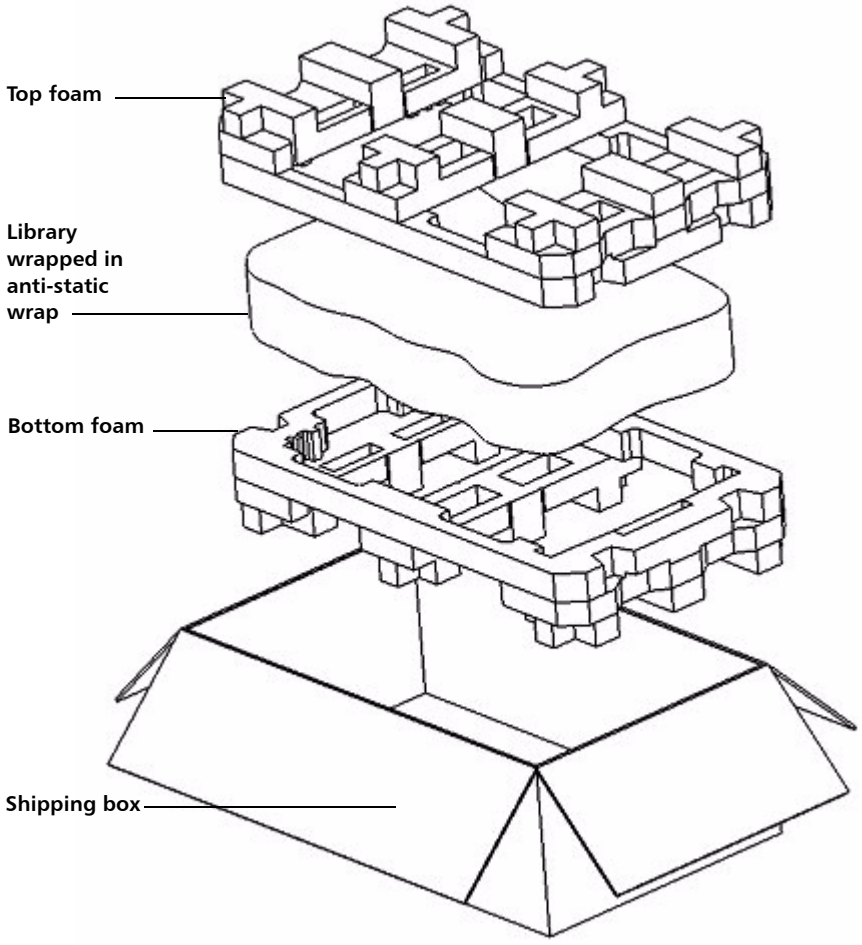
Caution: If you place the library upright with the robot restraint thumbscrews installed, you could damage the chassis or the robot.

13 Wrap the library in the anti-static wrapping provided in the packaging kit.

WARNING: Two people are required to safely lift the library.

14 Place the library in the packaging as shown in Figure 62.

Figure 62 Packing the Library for Shipping



Caution: When unpacking the library in its new location, lift it out of the packaging and immediately place it on its side to remove the four thumbscrews securing the robot to the floor of the library. Do not place it upright until you have removed the four thumbscrews, or you could damage the chassis or the robot. When placing the library on its side, do not set it on the "rack ear" or the magazine handle, or you could damage them.

Replacing the Robot

Robot replacement is a service-only procedure. If the robot fails, you will need to call Quantum Support for a replacement.

Chapter 9
Troubleshooting

The Scalar i40 and Scalar i80 libraries include advanced system monitoring and alerting mechanisms that inform you of library status and issues. The library provides you with status information about various library subsystems and components. It also notifies you of issues it detects and guides you through diagnosing and correcting issues before problems interfere with backups.

This chapter covers:

- About Diagnostic Tickets
- Capturing the Library Snapshot
- Troubleshooting Library "Not Ready" Messages
- Retrieving Tape Drive Logs
- Interpreting LEDs
- Running the Installation and Verification Test (IVT)
- Running the IVT Diagnostic Subtests Individually – Robotics, Tape Drive, and Magazine Tests
- Running the Random Move Test
- Performing Library Diagnostics
- Resetting Factory Defaults

About Diagnostic Tickets

The library uses advanced problem detection, reporting, and notification technology to alert you of problems as soon as they occur. The library performs numerous self-tests to monitor the library's temperature, voltage and currents, and standard library operations. It performs these self-tests each time the library is powered on and during normal operation when the library is idle.

If the self-test detects a problem, the library generates a diagnostic ticket that identifies the component that is likely causing the problem. If the problem is not severe, the library continues to provide full functionality to all unaffected partitions.

The tickets are assigned one of three priority levels:

- Low — The lowest level of priority. A ticket with low priority indicates that an abnormal condition existed within the library that warrants investigation and correction but the nature of the condition may have little or no effect on operations.
- High — The middle level of priority. A ticket with high priority indicates that a condition exists within the library that impacts system performance or redundancy. Typical library operations can continue without immediate corrective action, but a user should investigate the condition and correct the problem soon.
- Urgent — The highest level of priority. A ticket with urgent priority indicates that a failure has occurred or a serious condition exists within the library that requires immediate corrective action. In most cases, a hardware component is no longer functioning at an acceptable level or has failed. Typical library operations required for backup or restore are either not possible or highly unreliable.

The library has a number of visual cues to alert you that one or more diagnostic tickets exist:

- The library's ticket indicator LED turns on to indicate that at least one ticket exists (see Front Panel LEDs on page 251).
- The operator panel displays a health status icon (see Health status on page 29 for description).
- The Web client displays a subsystem status icon (see Subsystem Status on page 35).

You can frequently resolve a simple problem yourself, but if the problem is complex or involves a field replaceable unit (FRU), you will be directed to contact service. Only qualified service technicians can service FRUs.

Viewing, Closing, and Resolving Diagnostic Tickets

The initial status of all diagnostic tickets is Unopened. Once you select the **Resolve** button, the ticket status changes to Opened. When you close the ticket, its status changes to Closed. You can view Opened and Unopened tickets on both the operator panel and the Web client, but you can view Closed tickets only on the Web client.

You can view and close diagnostic tickets on both the operator panel and the Web client, but only the Web client provides a complete description of the event and guides you through a series of steps to resolve the issue. It is recommended that you use the Web client to view and resolve all your diagnostic tickets.

Only one person at a time can resolve a ticket. Multiple users can, however, view ticket details simultaneously.

If your Web client session goes down while resolving a diagnostic ticket, you must wait 3 minutes before you can continue resolving the diagnostic ticket.

Operator Panel

1. Select **Reports > Diagnostic Tickets**.
2. Select **Library**, **Tape Drives**, or **Media** as the tickets you want to view. Press **Select**.
3. All of the relevant tickets are listed. Scroll through and select the one you want to view. Press **View**.

   Basic details, such as ticket ID number, short description, priority, and when the ticket was created and updated, appear.
4. You can either press **Close** to close the ticket, or press **Exit** to exit without closing the ticket.

Web Client

1. You can view all diagnostic tickets by selecting **Tools > All Diagnostic Tickets**. Alternatively, you can view library, tape drive,

and media tickets separately via the Home Page Subsystem Status buttons (see Subsystem Status on page 35).

Whichever method you choose, the tickets are displayed in order of last occurrence of each event, beginning with the most recent.

Note: Last Occurrence indicates the last time a ticket event occurred. This information updates any time the event recurs. **Last Occurrence** does NOT update if you open, close, or resolve the diagnostic ticket.

2 Identify the diagnostic ticket you want to resolve.

Note: You can use the **Go to Diagnostic Ticket** text box at the bottom of the screen to locate a specific ticket number. In addition, if there is more than one page of tickets, use the **Page 1 of x** arrows to view the additional tickets.

3 To view more details about the ticket, including the location coordinates of resources that may be involved, click the **Details** button.

4 To resolve the ticket, click the **Resolve** button. A series of screens guides you through steps to resolve the issue on your own. If the situation cannot be resolved, you are instructed to contact technical support. When you have finished reading all of the Resolution screens, do one of the following:

- To close the ticket now, click **Close**. The **Tools - All Diagnostic Tickets** window displays, with the ticket no longer in the list.
- To leave the ticket open for future troubleshooting, click **Exit**. The ticket remains on the list.

5 You can also close all tickets at once by clicking the **Close All Tickets** button.

Caution: Be careful when pressing the **Close All Tickets** button. This closes all diagnostic tickets even if they are not resolved. It is recommended that each diagnostic ticket be viewed, analyzed, and closed individually.

Note: To display all closed tickets, select the **Include Closed Tickets** check box at the bottom of the screen. The **Tools - All Diagnostic Tickets** screen refreshes, with the **Resolve** button unavailable for all closed diagnostic tickets.

Capturing the Library Snapshot

Technical support personnel may ask you to capture a snapshot of the library so they can better diagnose issues. The **Capture Snapshot** operation captures detailed information about the entire library in a single ASCII file that can be e-mailed to technical support personnel.

The logged information consists of configuration data, status information, and trace logs for library components. Trace logs collect problem data and provide support personnel with vital library information for troubleshooting and solving problems.

You can e-mail the snapshot file to a recipient or download it to a computer. If you want to e-mail it, ensure that the library e-mail account is appropriately configured before you perform the Capture Snapshot operation. If the library e-mail account address is not configured, an error appears. For information on configuring the e-mail account, see Configuring the Library E-Mail Account on page 74.

Depending on the library configuration and your connection speed, saving the snapshot file takes approximately 30 minutes. The resulting file size can be large. Your firewall file-size limitations could prohibit you from e-mailing the file.

You can only capture a snapshot via the Web client.

Web Client

1. Select **Tools > Capture Snapshot**.
2. Select whether to download the file or e-mail it to a recipient, and click **Apply**.

Troubleshooting Library “Not Ready” Messages

“Not Ready” Messages on the Operator Panel

If a “not ready” message appears on the operator panel at startup, it means the robot cannot move.

If the “not ready” message occurs upon initial installation (first time out of the box or after a chassis replacement), make sure you removed the robot restraint as described in Unpacking the Library on page 14.

If the robot has been properly released, or this has happened at a time other than initial startup, power cycle the library to clear the error. If that fails, contact Quantum Support.

“Not Ready” Messages on the Web Client

The Web client user interface includes a header that contains the company logo, product name, and the three main navigation buttons (Home, Help, and Logout). In addition, a message in the header alerts you when the library is not ready. (No message displays in the header when the library is in a ready state.) For more information on Web client user interface elements, see Web Client Layout and Functions on page 32.

Library “not ready” messages continue to display in the header until the issue has been resolved, and the robot has completed its calibration.

If the library displays a “not ready” message, you may be able to tell from the message how to remedy the situation. If not, the library generates a diagnostic ticket whenever the library encounters a problem. The diagnostic ticket may provide information that can help you troubleshoot the problem. For more information, see About Diagnostic Tickets on page 244.

The library “not ready” messages include the following, with possible solutions listed:

Message	Resolution
Library is not ready	The library is initializing and becoming ready. Wait for the library to finish initialization.
Library is becoming ready	Wait for the library to finish initialization.
Library is not initialized	Most likely a problem with the robot. Try the following: • Check the diagnostic ticket and follow the resolution steps listed (see About Diagnostic Tickets on page 244). • Power cycle the library to clear the error. If that fails, contact Quantum Support.
Library needs manual attention	Most likely a problem with the robot or other component. Try the following: • Check the diagnostic ticket and follow the resolution steps listed (see About Diagnostic Tickets on page 244). • Power cycle the library to clear the error. If that fails, contact Quantum Support.

Note: You may not see the “not ready” message in the Web client until the browser refreshes. Similarly, even if the problem has been resolved, the “not ready” message will not disappear from the Web client until the browser refreshes.

Retrieving Tape Drive Logs

The library allows you to retrieve tape drive logs using the Web client. Tape drive log information can be used to help troubleshoot the library, the tape drive sled, and tape drive issues.

Since the log retrieval process can take up to 30 minutes, the tape drive and associated partition are automatically taken offline during the operation and brought back online when the operation completes. You will be asked to confirm that you want to take the tape drive and partition offline.

Tape drive log files adhere to the following naming convention: UDS_ID_SN.DMP, where ID identifies the tape drive coordinate location within the library and SN identifies the tape drive serial number.

You can only retrieve tape drive logs via the Web client.

Web Client

1. Select **Tools > Drive Operations**.
2. Select Retrieve Tape Drive Log.
3. Click **Apply**.
4. When the **Success** message appears, complete the next screens to save the log file to your computer.

Interpreting LEDs

LEDs provide a visual indication about the status of certain library components. LEDs can sometimes communicate that a problem exists when diagnostic tickets cannot.

The following components of the library have LEDs:

- Front panel
- System control board (SCB)

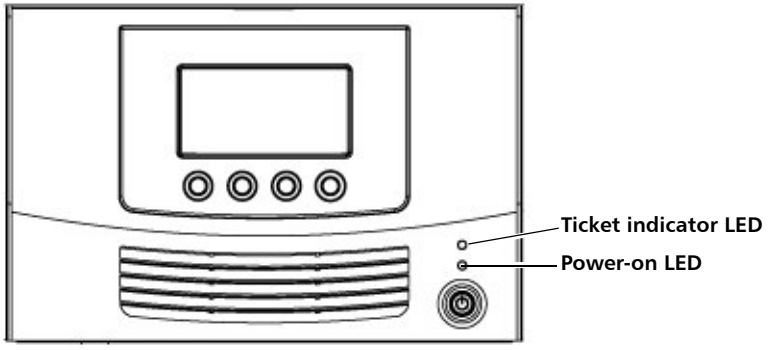
- Tape drives
- Power supplies

Front Panel LEDs

There are two LEDs on the front panel, above the power button. They function as follows:

LED Location	Color	Indicates
Power-on LED (closest to power button)	Green	Library power is **ON**.
Ticket indicator LED. (farthest from power button)	Amber	The LED is illuminated when at least one open or unopened diagnostic ticket exists.

Figure 63 Front Panel LEDs

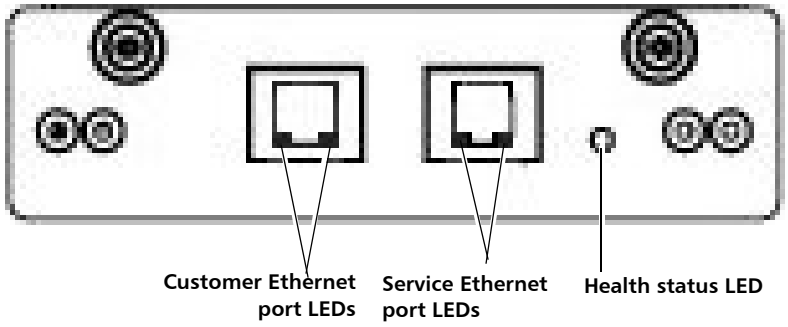


System Control Board LEDs

The SCB has one health status LED. In addition, each Ethernet port contains two LEDs, a green "activity indicator" and an amber "link indicator." The Ethernet port closest to the center of the library is for customer use. The Ethernet port farthest from the center of the library is for service use only.

LED	Color	Indicates
SCB Health Status LED	Green	Healthy and operational.
	Red	Failure. Replacement required.
Ethernet Port Green LED (Activity Indicator)	Green	This LED illuminates when actual "traffic" is being sent over the Ethernet cable. The LED may be blinking or on solid; it blinks more rapidly the more traffic is being sent over the connection. When the LED is lit, communications are in process and when the LED is off no communication is occurring.
Ethernet Port Amber LED (Link Indicator)	Amber	This LED illuminates solidly when a "link" is established, and will be off when no "link" is present. "Link" means an Ethernet cable is connected and the other end of the cable is also connected to another powered-up and operational Ethernet device.

Figure 64 System Control Board LEDs



Tape Drive/Sled LEDs

The library supports SAS and Fibre Channel tape drives. The drive sled LEDs for each are described below.

SAS

SAS Tape Drive Sleds have one LED that indicates the following:

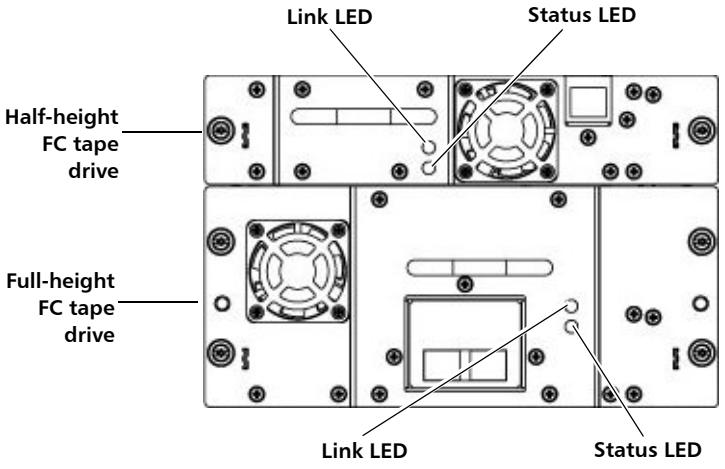
Color	Indicates
Green	Healthy and operational.
Amber	Tape drive is offline.
Red	Failure. Replacement required.

Fibre Channel

Fibre Channel tape drive sleds have two LEDs on their rear panel, indicated on the drive sled as STATUS and LINK (see Figure 65).

LED	Color	Indicates
Status	Green	Healthy and operational.
	Amber	Tape drive is offline.
	Red	Failure. Replacement required.
Link	Green	On solid — Fibre Channel link is present Flashing — Fibre Channel link is present and communications are in process
	Off	No Fibre Channel link is currently present.

Figure 65 Fibre Channel Tape Drive LEDs

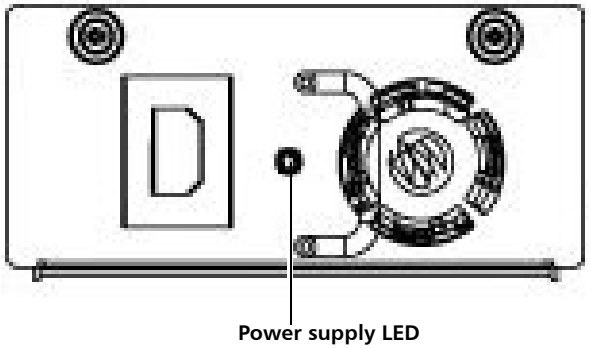


Power Supply LED

Diagnostic tickets typically report all problems related to power supplies. You can also observe the power supply LED to see if the power supply is functioning appropriately (see Figure 66). The power supply LED indicates the following:

LED Color	Indicates
Green	AC power is present and the library front panel power switch is turned **ON**.
Amber	AC power is present but the library front panel switch is turned **OFF**.
Red	Power supply failure.
Off	No power. Ensure the power supply is correctly plugged into a wall outlet.

Figure 66 Power Supply LED



Running the Installation and Verification Test (IVT)

The Installation and Verification Test (IVT) is used to evaluate a newly installed library. Its purpose is to verify that the robot is functioning properly, and that the magazines and tape drives are installed correctly

and reachable by the robot. It also verifies that barcode labels can be read by the robot scanning operation.

You should run the full IVT upon installation of a new library, and at any other time you remove, replace, or service components that require you to move the library into or out of a rack or desktop kit. You must run the robotics test after a robot replacement.

The full IVT is consists of three subtests. You may run the sub-tests separately (see Performing Library Diagnostics on page 259). The full IVT may take up to 30 minutes to complete.

- **Robotics Test** — a series of tests that evaluate the basic functionality of the robotics assembly, including picker travel, Y-carriage assembly travel, barcode scanning, calibration sensors, and several moves of a scratch tape. It also calibrates the robot to the library. The test takes up to 11 minutes to complete.
- **Tape Drive Test** — for each installed tape drive, the robot moves a scratch tape into the tape drive, inventories the scratch tape, and moves the scratch tape out of the tape drive. The test takes 1–2 minutes per tape drive.
- **Magazine Test** — moves a scratch tape through all storage slots in the library. These tests verify the robotics can reach all the slots in the magazine for both get and put operations. The test takes up to 5 minutes per magazine.

Details on running the IVT subtests include:

The IVT requires you to provide a scratch tape before the test can begin. You will be prompted to place a scratch tape into the top I/E station slot. When you close the I/E station, the **Assign IE** screen appears if Manual Cartridge Assignment is enabled (**Setup > System Settings**). Assign the new scratch tape to the **System** partition, and then select **Apply**.

- Before IVT starts, a check is performed to verify a scratch tape is in the top I/E slot and assigned to the system partition. If it is not, all three tests will immediately fail.
- The scratch tape must be compatible with all tape drives. If any tape drive cannot accept the scratch tape, the test will not start and will fail. For a list of supported media, see Supported Media on page 273.
- The operator panel displays progress of all three tests. Before a test begins, its progress is “Scheduled.” When a test begins, its progress

changes to “Running.” Once a test completes, its progress changes to either “Passed” or “Failed.”

- You can stop the IVT by pressing the **Stop** button. The progress of the currently running test changes to “Stopping.” Once stopped, the current test and all other scheduled tests display “Stopped.”
- Running IVT logs all users off of the Web client.

You can only perform the IVT from the operator panel.

Operator Panel

1. Install a scratch tape in the top I/E station slot.
2. If manual cartridge assignment is enabled, assign the scratch tape to the System partition.
3. Select **Tools** > **IVT**.
4. Press **Yes** to start the test.

Running the IVT Diagnostic Subtests Individually – Robotics, Tape Drive, and Magazine Tests

If you do not need to run the full IVT, you can run the robotics, tape drive, or magazine test separately to check an individual component. You should do this when you remove, replace, or service a component that does not require you to remove the library into or out of a rack or desktop kit.

Details about running the diagnostic subtests is the same as for the full IVT (see Running the Installation and Verification Test (IVT) on page 255) with the following exceptions:

- For the Tape Drive and Magazine diagnostics, you will choose just one device on which to run the diagnostic, rather than all. The tape drive test only tests the selected tape drive. The magazine test tests all the slots in the selected magazine.

- Once a diagnostic test starts, you cannot stop it. You must let it run to completion. When complete, the operator panel displays "passed" or "failed."

You can only perform the subtests on the operator panel.

Operator Panel

1. Install a scratch tape in the top I/E station slot.
2. Assign the scratch tape to the System partition.
3. Select **Tools > Diagnostics.**
4. Select **Robotics Test**, **Tape Drive Test**, or **Magazine Test** and press **Select**.
5. For the tape drive or magazine test, select which tape drive or magazine you want to test and press **Select**.
6. Press **Run**.

Running the Random Move Test

This will perform a demo that consists of moving a scratch tape into random slots around the library. Partitions are set offline and the test runs continuously until you stop it. You can only run this test from the operator panel.

Operator Panel

1. Install a scratch tape in the top I/E station slot.
2. Assign the scratch tape to the System partition.
3. Select **Tools > Random Move Test.**
4. Press **Run**.
5. When you are ready to stop the test, press **Stop**.
6. When the operator panel displays the message that the test has stopped, press **OK**.

Performing Library Diagnostics

The Diagnostics menu on the Web client contains tests you can run to determine if tape drives and robotics, are working as they should.

Notes about Diagnostics include:

- Entering Diagnostics takes all your library partitions offline. Be sure any crucial operations have stopped before you enter Diagnostics. When you exit Diagnostics, your partitions return to the online/offline status they were in previously.
- Only users with Admin level privileges can access Diagnostics.
- Only one user can be logged into Diagnostics at a time. Entering Diagnostics disconnects all other Web client users with the same or lower privileges (the operator panel user is not logged out, but any attempted operation using partitions will fail). Users will be unable to log in to the Web client and will get an error message stating that Diagnostics is in progress.
- You can only enter Diagnostics from the Web client.

Web Client

1. Select **Tools > Diagnostics**.

   A confirmation dialog appears, alerting you that all other users will be logged out and library partitions will be taken offline.

2. Click **OK**.

   You are now in a page that looks much like the regular Home page, but with different choices in the menu bars. Also, you will notice that all your partitions are offline.

3. Select the test you want to run from the menus. Your choices include:

   - Tape Drive Reset (see Resetting a Tape Drive on page 260 for more information)
   - Robotics Get/Put Test (see Robotics Get/Put Test on page 261 for more information)

4. To exit Diagnostics, select **Exit**.

Resetting a Tape Drive

The Drive Reset operation power cycles the tape drive while the tape drive remains in the drive sled in the library. You may want to perform a reset if a tape drive does not come ready or it is not behaving properly (for example, if a tape is stuck in the drive and will not unload).

The reset may take several minutes. After the reset operation completes, the tape drive is rebooted and reconfigured. This takes about 60 seconds. Wait 60 seconds before performing further drive operations.

You may perform a tape drive reset from either the operator panel or the Web client. If you use the Web client, you must enter Diagnostics, which logs out all users of the same or lower privilege level (see Performing Library Diagnostics on page 259).

Operator Panel

1. Select **Actions > Tape Drive > Reset**.
2. Select the tape drive you want to reset and push **Reset**.

   Once the operation completes, the operator panel displays a message stating that the operation completed, and there will be diagnostic tickets if it failed.
3. Press **OK**.
4. Check to see if the library generated diagnostic tickets.

Web Client

1. Enter Diagnostics (**Tools > Diagnostics**, then click **OK** to take partitions offline and log out all other users of the same or lower privileges).
2. Select **Drives > Drive Tests > Drive Reset**.
3. If the tape drives are assigned to more than one partition, select the partition in which the tape drive(s) you want to reset are located. Select **Unassigned** if the tape drive(s) you want to reset are not assigned to a partition. Click **Next**.
4. Select the tape drive(s) you want to reset.
5. Click **Apply**.
6. The test runs. When complete, a “success” or “failure” message appears.

Robotics Get/Put Test

The Get/Put Test requires the robot to remove one tape cartridge from the top I/E station slot, and then put the tape cartridge back into the same slot. To run this test, you must insert a tape into the library's top (uppermost) I/E station slot.

You can only perform this test from the Web client, by entering Diagnostics (see Performing Library Diagnostics on page 259).

Web Client

1. Install a scratch tape in the top I/E station slot.
2. If manual cartridge assignment is enabled, assign the scratch tape to the System partition.
3. Enter Diagnostics (**Tools > Diagnostics**, then click **OK** to take partitions offline and log out all other users of the same or lower privileges).
4. Select **Robotics > Robotics Get/Put Test**.
5. Click **Apply**.
6. The test runs. When complete, a "success" or "failure" message appears.

Resetting Factory Defaults

Resetting factory defaults restores the library's default configuration (see Default Configuration on page 42).

- **Resetting factory defaults clears:** most of the library's configurable items, such as partitions, user accounts, import/export (I/E) station slots, cleaning slots, and so on. It also clears all diagnostic tickets and log information, and deletes user-provided tape drive firmware used for autoleveling.
- **Resetting factory defaults does NOT clear:** date and time, network configuration, or license key settings, nor does it change the library firmware version.

You may want to reset factory defaults if you are completely reinstalling or reconfiguring the library.

If you downgrade from one firmware version to an earlier version, library configuration settings will be reset to the factory defaults for the newly installed firmware.

If you upgrade firmware, your library configuration settings remain as you have set them.

Web Client

On the Web client, this feature is only available to service users using the service login and password.

Operator Panel

On the operator panel, if logins are disabled (default), this operation is available to all users. If logins are enabled, this operation is only available to service users using the service login and password.

1. Select **Tools > Reset Factory Defaults**.

   A message appears stating that configuration data will be cleared and library rebooted.

2. Press **Yes** to continue.

Chapter 10
Working With Cartridges and Barcodes

This chapter describes how to work with cartridges and barcodes. When working with tape cartridges, certain considerations should be taken into account. For example, all tape cartridges in the library must have a barcode label. In addition, when loading your library, you should be aware of whether or not your cartridges are write-protected.

This section discusses these types of items in general terms. See Supported Media on page 273 for information on what type of tape cartridges are supported for each drive type.

This chapter covers:

- Handling Cartridges Properly
- Write-Protecting Tape Cartridges
- Barcode Requirements
- Installing Barcode Labels

Handling Cartridges Properly

To ensure the longest possible life for your cartridges, follow these guidelines:

- Select a visible location to post procedures that describe proper media handling.
- Ensure that anyone who handles cartridges has been properly trained on all procedures.
- Do not drop or strike cartridges. Excessive shock could damage the internal contents of cartridges or the casings themselves, rendering the cartridges unusable.
- Do not expose cartridges to direct sunlight or sources of heat, including portable heaters and heating ducts.
- Do not stack cartridges more than five high.
- The operating temperature range for Linear Tape Open (LTO) cartridges is 50ºF to 104ºF (10ºC to 40ºC). The operating relative humidity range is 20% to 80% (non-condensing).
- If cartridges have been exposed to temperatures outside the range specified above, stabilize the cartridges at normal operating room temperature for the same amount of time they were exposed to extreme temperatures or 24 hours, whichever is less. Temperatures above 125ºF (52ºC) can cause permanent damage.
- Do not place cartridges near sources of electromagnetic energy or strong magnetic fields, such as computer monitors, electric motors, speakers, or x-ray equipment. Exposure to electromagnetic energy or magnetic fields can destroy data and the embedded servo code written on the media by the cartridge manufacturer, rendering the cartridges unusable.
- Place identification labels only in the designated slots on the cartridges.
- If you ship cartridges, ship them in their original packaging or something stronger.

- Do not insert damaged cartridges into tape drives.
- Do not touch the tape or tape leader.

Caution: Do not degauss cartridges that you intend to reuse.

Write-Protecting Tape Cartridges

All tape cartridges have a write-protect (write-inhibit) switch to prevent accidental erasure or overwriting of data. Before loading a tape cartridge into the library, make sure that the write-protect switch is positioned correctly (either on or off).

Slide the red or orange write-protect switch to the right so that the padlock shows in the closed position. The switch is located on the left side of the cartridge front.

Barcode Requirements

Cartridges must have an external barcode label that is machine readable. A barcode must use only uppercase letters A to Z and/or numeric values 0 to 9. The library supports Code 39 (3 of 9) type barcodes.

The supported tape cartridge barcode formats are as follows:

- **Standard Six** — Six character barcode number with or without a one or two-character media ID, for example, “XXXXXXL4” or “XXXXXX”. Only the six character barcode is reported to the host.
- **Plus Six** — Six character barcode number followed by a media ID, for example, “XXXXXXL3”. Six character barcode and media ID are reported to the host.
- **Extended** — Five to 15 characters total, including a barcode number and optional media ID. All characters are reported to the host, regardless of having a media ID or not. If a media ID is

included, the label must have a five to 13 character barcode followed by a media ID, for example, “XXXXXXXXXXXXXL2”. If a media ID is not included, the label must have a five to 15 character barcode, for example, “XXXXXXXXXXXXXXX”.

- **Media ID Last** — Five to 13 character barcode number followed by media ID, for example, “XXXXXXXXXXXXXLT”. The media ID is reported to the host last.
- **Media ID First** — Five to 13 character barcode number preceded by media ID, for example, “L4XXXXXXXXXXXXX”. The media ID is reported to the host first.
- **Standard** — (default) Five to 15 characters total, including a barcode number and optional media ID. The media ID is not reported to the host. If a media ID is included, the label must have a five to 13 character barcode followed by a media ID, for example, “XXXXXXXXXXXXXL3”. If a media ID is not included, the label must have a five to 15 character barcode, for example, “XXXXXXXXXXXXXXX”.

Quantum-supplied barcode labels provide the best results. Barcode labels from other sources can be used, but they must meet the following requirements:

- ANSI MH10.8M-1983 Standard
- Number of digits: 5 to 15 (default for LTO is 6+2)
- Background reflection: greater than 25 percent
- Print contrast: greater than 75 percent
- Ratio: greater than 2.2
- Module: minimum .254 mm (10 mil)
- Print tolerance: ± 57 mm
- Additional Requirements:
- Length of the rest zones: 5.25 mm ± 0.25 mm
- No black marks should be present in the intermediate spaces or rest zones
- No white areas should be present on the bars

Installing Barcode Labels

Each cartridge in the library must have an external label that is machine readable to identify the barcode. Most manufacturers offer cartridges with the labels already applied or with the labels included that you can attach.

All barcode labels must be applied to the front of a cartridge. Peel off the label and place it on the cartridge. Verify that the label is oriented so that the numbers appear above the barcode. The cartridge cannot have any stickers or labels attached to the top or bottom because if the labels come loose, they can get caught in the tape drives or become unreadable by the scanner.

Caution: Do not place a barcode label or any labels on the top or bottom of a cartridge. Doing so can cause the tape cartridge and tape drive operations to fail.

Appendix A

Specifications

Physical Specifications

Table 5 Base Library

	Scalar i40	Scalar i80
Height	5.2 in. (132 mm)	10.4 in. (264 mm)
Width (excluding "rack ears"	17.5 in. (445 mm)	17.5 (445 mm)
Depth (from library front bezel to back of library; excluding drive sleds)*	31.2 in. (793 mm)	31.2 in. (793 mm)
Weight (one power supply, no tape drives, and no tape cartridges installed)	34.9 lbs. (15.8kg)	52.4 lbs. (23.8 kg)
Weight (one power supply, two tape drives, and no tape cartridges installed)	With 2 half-height SAS tape drives: 44.2 lbs. (20 kg)	With 2 full-height SAS tape drives: 65.7 lbs. (29.8 kg)

* Depths listed above exclude drive sleds. Drive sleds will add up to 50 mm to the overall length of the library depending on tape drive type (half-height, full-height, Fibre Channel, SAS). Additionally, when planning space requirements, take into account installed cables (particularly fibre-optic cable radius on Fibre Channel tape drives).

Table 6 Library Installed in a Desktop Kit

	Scalar i40	Scalar i80
Height (with desktop "feet" installed)	5.3 in. (135.6 mm)	10.6 in. (268.8 mm)
Width	18.9 in. (480 mm)	18.9 in. (480 mm)
Depth (from library front bezel to back of library; excludes drive sleds)*	31.2 in. (793 mm)	31.2 in. (793 mm)

* Depths listed above exclude drive sleds. Drive sleds will add up to 50 mm to the overall length of the library depending on tape drive type (half-height, full-height, Fibre Channel, SAS). Additionally, when planning space requirements, take into account installed cables (particularly fibre-optic cable radius on Fibre Channel tape drives).

Capacity

	Scalar i40	Scalar i80
Form Factor	3U	6U
Maximum number of tape drives	1 full-height or 2 half-height tape drives	3 full-height or 5 half-height tape drives
Number of magazines	2 magazines (20 slots each	4 magazines (20 slots each)
Number of cartridge slots	Base unit: 25 Fully licensed: 40	Base unit: 50 Fully licensed: 80
Maximum native capacity	25 slots: 20 TB 40 slots: 32 TB	50 slots: 40 TB 80 slots: 64 TB
Number of I/E station slots	0 or 5	0, 5, or 10

Environmental Specifications

The environmental specifications of the library are listed below.

Note: Temperature ranges apply to product inlet temperatures, not necessarily to ambient room temperatures. Airflow restrictions or other heat-generating equipment within the rack enclosure may cause a rise over ambient room temperatures.

	Operating	Non-Operating	Shipping and Storage
Altitude	–500 to 10,000 ft (–152 to 3,048 m)	–500 to 10,000 ft (–152 to 3,048 m)	–500 to 10,000 ft (–152 to 3,048 m)
Temperature	50º to 95º F (10º to 35º C)	50º to 113º F (10º to 45º C)	–40º to 140º F (–40º to 60º C)
Relative Humidity	20 to 80%, non-condensing	10 to 90%, non-condensing	0 to 95%, non-condensing

Air Clearance Requirements

There must be at least 4 in. (10 cm) of open space in front of and behind the library for proper air flow

Power Specifications

	Scalar i40	Scalar i80
Line voltage	100 – 240 VAC	100 – 240 VAC*
Line frequency	50 – 60 Hz	50 – 60 Hz*
Rated AC Input Current	100 Volt – 2.8 Amps 240 Volt – 1.4 Amps	100 Volt – 5.0 Amps 240 Volt – 2.5 Amps
Typical Power Consumption	100 watts	200 watts

* A Scalar i80 library with dual power supplies will have these requirement on both AC inputs to the library but will load share the current draw equally between each supply and from each AC connection.

Communication Interfaces

Library Robot Control	Logical Unit Number (LUN)
Connectivity	Native drive interface (FC, SAS
Library Management	Operator panel Web client SNMP protocol SMI-S protocol

Supported Tape Drives

Vendor	Type	Interface
HP	LTO-4	Fibre Channel (4 Gb, LC connector)
		SAS (3 Gb, SFF-8088 connector)

Supported Media

Cartridge Type	Access
LTO-4	Read/write in LTO-4 tape drives; supports WORM functionality
LTO-3	Read/write in LTO-4 tape drives; supports WORM functionality
LTO-2	Read-only in LTO-4 tape drives

Supported Internet Browsers

The Internet browser software is not supplied with the Scalar i40 and Scalar i80 systems; you must obtain and install it independently. The Scalar i40 and Scalar i80 systems support the following Internet browsers:

Note: For correct operation of the software, disable any pop-up blockers.

Microsoft® Windows®

- Internet Explorer® (IE) 6.0 or later
- Mozilla® Firefox® 1.0.6 or later

Linux®

- Firefox 1.0.6 or later

Solaris™

- Firefox 1.0.6 or later

Appendix B
Tape Alert Flag Descriptions

Tape Alert is an open industry standard that flags errors and provides possible solutions for storage devices and their media. This section provides information about Tape Alert flags, including the identifying number, severity, recommended message, and probable cause. Table 7 explains the severity codes, and Table 8 lists all the existing Tape Alert flags and their descriptions.

Support for specific Tape Alert flags may vary based on tape drive type and firmware revision. Not all tape drives support every Tape Alert. Consult your tape drive SCSI manual for more information.

For more information on Tape Alert, see http://www.t10.org/index.html for INCITS *SCSI Stream Commands - 3 (SSC-3)*.

Table 7 Tape Alert Flag Severity Codes

I	**Informational**.
W	**Warning** — The system may not be operating optimally. Continued operation without corrective action may cause a failure or raise critical Tape Alert flags.
C	**Critical** — Either a failure has already occurred or a failure is imminent. Corrective action is required.

Table 8 Tape Alert Flag Descriptions

No.	Flag	Severity	Recommended Application Client Message	Probable Cause
1	Read warning	W	The tape drive is having problems reading data. No data has been lost, but there has been a reduction in the performance of the tape.	The drive is having severe trouble reading.
2	Write warning	W	The tape drive is having problems writing data. No data has been lost, but there has been a reduction in the capacity of the tape.	The drive is having severe trouble writing.
3	Hard error	W	The operation has stopped because an error has occurred while reading or writing data which the drive cannot correct.	The drive had a hard read or write error.
4	Media	C	Your data is at risk: **1** Copy any data you require from this tape. **2** Do not use this tape again. **3** Restart the operation with a different tape.	Media can no longer be written/read, or performance is severely degraded.
5	Read failure	C	The tape is damaged or the drive is faulty. Call the tape drive supplier help line.	The drive can no longer read data from the tape.
6	Write failure	C	The tape is from a faulty batch or the tape drive is faulty: **1** Use a good tape to test the drive. **2** If the problem persists, call the tape drive supplier help line.	The drive can no longer write data to the tape.

No.	Flag	Severity	Recommended Application Client Message	Probable Cause
7	Media life	W	The tape cartridge has reached the end of its calculated useful life: **1** Copy any data you need to another tape. **2** Discard the old tape.	The media has exceeded its specified life.
8	Not data grade	W	The tape cartridge is not data-grade. Any data you write to the tape is at risk. Replace the cartridge with a data-grade tape.	The drive has not been able to read the MRS* stripes.
9	Write protect	C	You are trying to write to a write-protected cartridge. Remove the write-protection or use another tape.	Write command is attempted to a write- protected tape.
10	Media removal prevented	I	You cannot eject the cartridge because the tape drive is in use. Wait until the operation is complete before ejecting the cartridge.	Manual or software unload attempted when prevent media removal on.
11	Cleaning media	I	The tape in the drive is a cleaning cartridge.	Cleaning tape loaded into drive.
12	Unsupported format	I	You have tried to load a cartridge of a type which is not supported by this drive.	Attempted load of unsupported tape format.
13	Recoverable mechanical cartridge failure	C	The operation has failed because the tape in the drive has experienced a mechanical failure: **1** Discard the old tape. **2** Restart the operation with a different tape.	Tape snapped/cut or other cartridge mechanical failure in the drive where medium can be demounted.

No.	Flag	Severity	Recommended Application Client Message	Probable Cause
14	Unrecoverable mechanical cartridge failure	C	The operation has failed because the tape in the drive has experienced a mechanical failure: **1** Do not attempt to extract the tape cartridge. **2** Call the tape drive supplier help line.	Tape snapped/cut or other cartridge mechanical failure in the drive where medium cannot be demounted.
15	Memory chip in cartridge failure	W	The memory in the tape cartridge has failed, which reduces performance. Do not use the cartridge for further write operations.	Memory chip failed in cartridge.
16	Forced eject	C	The operation has failed because the tape cartridge was manually demounted while the tape drive was actively writing or reading.	Manual or forced eject while drive actively writing or reading.
17	Read-only format	W	You have loaded a cartridge of a type that is read-only in this drive. The cartridge will appear as write protected.	Media loaded that is read-only format.
18	Tape directory corrupted on load	W	The directory on the tape cartridge has been corrupted. File search performance will be degraded. The tape directory can be rebuilt by reading all the data on the cartridge.	Tape drive powered down with tape loaded, or permanent error prevented the tape directory being updated.
19	Nearing media life	I	The tape cartridge is nearing the end of its calculated life. It is recommended that you: **1** Use another tape cartridge for your next backup. **2** Store this tape cartridge in a safe place in case you need to restore data from it.	Media may have exceeded its specified number of passes.

No.	Flag	Severity	Recommended Application Client Message	Probable Cause
20	Cleaning required	C	The tape drive needs cleaning: **1** If the operation has stopped, eject the tape and clean the drive. **2** If the operation has not stopped, wait for it to finish and then clean the drive. Check the tape drive user's manual for device-specific cleaning instructions.	The drive thinks it has a head clog or needs cleaning.
21	Cleaning requested	W	The tape drive is due for routine cleaning: **1** Wait for the current operation to finish. **2** Then use a cleaning cartridge. Check the tape drive user's manual for device-specific cleaning instructions.	The drive is ready for a periodic cleaning.
22	Expired cleaning media	C	The last cleaning cartridge used in the tape drive has worn out: **1** Discard the worn-out cleaning cartridge. **2** Wait for the current operation to finish. **3** Then use a new cleaning cartridge.	The cleaning tape has expired.
23	Invalid cleaning tape	C	The last cleaning cartridge used in the tape drive was an invalid type: **1** Do not use this cleaning cartridge in this drive. **2** Wait for the current operation to finish. **3** Then use a valid cleaning cartridge.	Invalid cleaning tape type used.

No.	Flag	Severity	Recommended Application Client Message	Probable Cause
24	Retension requested	W	The tape drive has requested a retension operation.	The drive is having severe trouble reading or writing, which will be resolved by a retension cycle.
25	Multi-port interface error on a primary port	W	A redundant interface port on the tape drive has failed.	Failure of one interface port in a dual-port configuration (for example, Fibre Channel).
26	Cooling fan failure	W	A tape drive cooling fan has failed.	Fan failure inside tape drive mechanism or tape drive enclosure.
27	Power supply failure	W	A redundant power supply has failed inside the tape drive enclosure. Check the enclosure user's manual for instructions on replacing the failed power supply.	Redundant power supply unit failure inside the tape drive enclosure or rack subsystem.
28	Power consumption	W	The tape drive power consumption is outside the specified range.	Power consumption of the tape drive is outside specified range.
29	Drive preventive maintenance required	W	Preventive maintenance of the tape drive is required. Check the tape drive user's manual for device-specific preventive maintenance tasks or call the tape drive supplier help line.	The drive requires preventative maintenance (not cleaning).
30	Hardware A	C	The tape drive has a hardware fault: **1** Eject the tape or magazine. **2** Reset the drive. **3** Restart the operation.	The drive has a hardware fault that requires reset to recover.

No.	Flag	Severity	Recommended Application Client Message	Probable Cause
31	Hardware B	C	The tape drive has a hardware fault: **1** Turn the tape drive off and then on again. **2** Restart the operation. **3** If the problem persists, call the tape drive supplier help line.	The drive has a hardware fault that is not read/write related or requires a power cycle to recover.
32	Primary interface	W	The tape drive has a problem with the host interface: **1** Check the cables and cable connections. **2** Restart the operation.	The drive has identified an interface fault.
33	Eject media	C	The operation has failed: **1** Eject the tape or magazine. **2** Insert the tape or magazine again. **3** Restart the operation.	Error recovery action.
34	Microcode update fail	W	The microcode update has failed because you have tried to use the incorrect microcode for this tape drive. Obtain the correct microcode and try again.	Microcode update failed.
35	Drive humidity	W	Environmental conditions inside the tape drive are outside the specified humidity range.	Drive humidity limits exceeded.
36	Drive temperature	W	Environmental conditions inside the tape drive are outside the specified temperature range.	Cooling problem.
37	Drive voltage	W	The voltage supply to the tape drive is outside the specified range.	Drive voltage limits exceeded.
38	Predictive failure	C	A hardware failure of the tape drive is predicted. Call the tape drive supplier help line.	Predictive failure of drive hardware.

No.	Flag	Severity	Recommended Application Client Message	Probable Cause
39	Diagnostics required	W	The tape drive may have a hardware fault. Run extended diagnostics to verify and diagnose the problem. Check the tape drive user's manual for device-specific instructions on running extended diagnostic tests.	The drive may have a hardware fault that may be identified by extended diagnostics (i.e., SEND DIAGNOSTIC command).
40 – 46	Obsolete			
47 – 49	Reserved			
50	Lost statistics	W	Media statistics have been lost at some time in the past.	Drive or library powered down with tape loaded.
51	Tape directory invalid at unload	W	The tape directory on the tape cartridge just unloaded has been corrupted. File search performance will be degraded. The tape directory can be rebuilt by reading all the data.	Error prevented the tape directory being updated on unload.
52	Tape system area write failure	C	The tape just unloaded could not write its system area successfully: **1** Copy data to another tape cartridge. **2** Discard the old cartridge.	Write errors while writing the system area on unload.
53	Tape system area read failure	C	The tape system area could not be read successfully at load time: **1** Copy data to another tape cartridge.	Read errors while reading the system area on load.

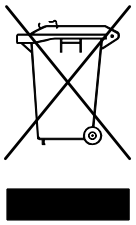
No.	Flag	Severity	Recommended Application Client Message	Probable Cause
54	No start of data	C	The start of data could not be found on the tape: **1** Check that you are using the correct format tape. **2** Discard the tape or return the tape to your supplier.	Tape damaged, bulk erased, or incorrect format.
55	Loading or threading failure	C	The operation has failed because the media cannot be loaded and threaded: **1** Remove the cartridge, inspect it as specified in the product manual, and retry the operation. **2** If the problem persists, call the tape drive supplier help line.	The drive is unable to load the media and thread the tape.
56	Unrecoverable unload failure	C	The operation has failed because the medium cannot be unloaded: **1** Do not attempt to extract the tape cartridge. **2** Call the tape driver supplier help line.	The drive is unable to unload the medium.
57	Automation interface failure	C	The tape drive has a problem with the automation interface: **1** Check the power to the automation system. **2** Check the cables and cable connections. **3** Call the supplier help line if problem persists.	The drive has identified an interface fault.
58	Microcode failure	W	The tape drive has reset itself due to a detected microcode fault. If problem persists, call the supplier help line.	Microcode bug.
59	WORM medium — integrity check failed	W	The tape drive has detected an inconsistency during the WORM medium integrity checks. Someone may have tampered with the cartridge.	Someone has tampered with the WORM medium.

No.	Flag	Severity	Recommended Application Client Message	Probable Cause
60	WORM medium — overwrite attempted	W	An attempt had been made to overwrite user data on a WORM medium: **1** If a WORM medium was used inadvertently, replace it with a normal data medium. **2** If a WORM medium was used intentionally: **a)** Check that the software application is compatible with the WORM medium format you are using. **b)** Check that the medium is bar-coded correctly for WORM.	The application software does not recognize the medium as WORM.
61 – 64	Reserved			

* Media Recognition System (MRS) is a method where pre-defined stripes are placed at the beginning of the media to identify the media. The MRS stripes are read to determine if the media is of data-grade. Data-grade media should be used in SCSI streaming devices since it is of the required quality and consistency to be used to store data (i.e., audio/video grade media should not be used).

Appendix C

Disposal of Electrical and Electronic Equipment



This symbol on the product or on its packaging indicates that this product should not be disposed of with your other waste. Instead, it should be handed over to a designated collection point for the recycling of electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please visit our website at: http://qcare.quantum.com or contact your local government authority, your household waste disposal service or the business from which you purchased the product.

含汞電池
減少使用
務必回收

Glossary

Numerals

1U, 2U, 3U, etc. Racks manufactured for mounting computer hardware often define vertical space as "units." The components that are mounted in the racks are defined by how many units of rack space they require. For example, the height of a unit in a rack is 1.75 inches. If a component is 5.25 inches in thickness, the component is said to be a 3U component.

A

Arbitrated loop A Fibre Channel configuration that attaches multiple communicating ports in a loop. Two or more ports can interconnect, but only two ports can communicate simultaneously.

Arbitration The submission of a request to gain access to an arbitrated loop by a device, so that it can transmit data in the loop.

B

Barcode A printed array of varied rectangular bars and spaces that can be scanned and read for object identification.

Bus A transmission channel through which electrical signals are carried from one device to another device.

C

Cartridge A container that is a protective housing for storage media, such as cartridges for tapes or optical disks.

Cleaning tape / cleaning cartridge A tape used to clean recording heads and reading heads on a tape drive.

Cleaning slot The physical home where a cleaning tape or cartridge resides.

COD (Capacity on Demand) A library feature that allows users to have a large physical library, but only be licensed to use a subset of its total capacity. Users pay only for what they are currently using. License upgrades enable more capacity without causing a system interruption.

Connectivity The method by which hardware devices or software communicate with other hardware or software.

Control path The connection between a partition and host application. The control path connection is made through a designated tape drive. Only one tape drive can be selected as the control path per partition.

Controller The PCB or system that translates computer data and commands into a form suitable for use by the storage disks.

CRU (Customer Replaceable Unit) The smallest hardware component that can be replaced at a customer installation by a customer.

D

Default A value or setting that is selected by the hardware or software unless specified otherwise by the user.

DHCP (Dynamic Host Configuration Protocol) A protocol for assigning dynamic IP addresses to devices on a network. DHCP supports a mix of static and dynamic IP addresses.

Diagnostic ticket A ticket that alerts service personnel and customers of an issue with the library. Diagnostic tickets identify which library components are most likely causing the issue. When possible, a diagnostic ticket provides instructions for resolving the issue.

Directory A file that contains a list of other files. *Directory* is short for *directory file*.

Drivers Software programs that enable a computer to communicate with hard drives, CD ROM drives, printers, and other peripherals. Drivers are stored on a hard disk and loaded into memory at boot up.

E

Element ID - Logical An address used by a library to locate and track library component. The address is specified in programming logic rather than on the physical location of a component within a library. When a logical library is used, the logical element ID masks the physical element ID.

Element ID - Physical An address used by a library to locate and track library component. The address is based on the physical location of a component within a library. Applications expect to see resources at specific IDs.

Ethernet A type of local area network designed to transport data at rates up to 100 million bits per second. Other software, such as TCP/IP runs on top of Ethernet to provide high-level networking services to applications.

Event A condition that matches a numbered, predefined set of circumstances.

Event log A list of all predefined events logged by library and software management tools.

F

FC (Fibre Channel) A high speed data transfer architecture. Using optical fibre to connect devices, Fibre Channel communications are serial communications that occur at full duplex and achieve data transfer rates of 200 MBps.

FC-AL (Fibre Channel Arbitrated Loop) A form of Fibre Channel network in which up to 126 nodes are connected in a loop topology. See also *Arbitrated loop*.

FC-AL Device A device that employs Fibre Channel-Arbitrated Loop and consists of one or more NL_Ports.

Fiber A thin filament of glass. An optical waveguide consisting of a core and a cladding which is capable of carrying information in the form of light. Fiber is also a general term used to cover all

physical media types supported by Fibre Channel, such as optical fiber, twisted pair, and coaxial cable.

Firewall A set of security tools designed to separate an internal network from the public Internet in order to keep unauthorized users out of a restricted network. Firewalls are the primary line of security defense for businesses.

FL_Port Fabric Loop Port. An F_Port that is capable of supporting an attached Fibre Channel Arbitrated Loop. An FL_Port on a loop will have the AL_PA hex'00' giving the fabric the highest priority access to the loop. N_Ports or NL_Ports can attach to it in an Arbitrated Loop topology and are capable of communicating with FC-AL protocol.

FRU (Field Replaceable Unit) The smallest hardware component that can be replaced at a customer installation by a certified field service representative.

G

GUI (Graphical User Interface) A computer environment that provides a visual view of a system by incorporating windows, icons, menus, and a pointing device. Also referred to as a Windows, Icons, Mouse, and Pointers (WIMP) interface.

H

HDD (High Density Drive) A drive that contains increased storage capacity of bits and/or tracks per square inch.

Home position Accessor axes positioned at 0 vertical and 0 horizontal, that serve as the point of reference for the position of other library components. Home position is used as a basis for calibration.

Host In general, a host is a computer or program that contains data and provides services to other computers or devices. In Fibre Channel terms, a host is a computer that initiates contact with storage devices.

Hot swappable The ability to replace a defective component while the system continues to function normally.

HTTP (Hypertext Transfer Protocol) The communication rules by which a Web browser (client) and a server delivering Web pages exchange information.

I

I/E Import/Export. The movement of data or hardware in and out of processing and storage systems.

I/E slot A bin that contains a single piece of media in the station.

I/E station A door on the front of the library that contains tape magazines, into which cartridges to be imported are placed manually or cartridges to be exported are placed by the picker.

Interoperability The capability of two or more hardware devices or two or more software routines to work together.

IP (Internet Protocol) A protocol that specifies the formats of packets and addresses. Addresses are formulated as four groups of 2 or 3 digit numbers separated by periods, such as 255.255.255.255.

K

Kernel The heart of the UNIX operating system. The kernel is the part of the operating system that allocates resources and controls processes. The design strategy has been to keep the kernel as small as possible and to put the rest of the UNIX functionality into separately compiled and executed programs.

L

L_Port Loop Port. It only has the capability to communicate over FC-AL hubs and through FL_Ports.

LED (Light Emitting Diode) The mode of data transmission for multimode cables with short wave optical transceivers. Single-mode cables, by comparison, use high powered, long wave lasers.

Library A large-scale tape device with robotics that can house multiple tape drives and a significant amount of tape cartridges.

Library Control Module See *Control module*.

License key An absolute value that can only increase a licensed feature. For example, a license key can be applied to the library to enable unlicensed slots.

Logical library See *Partition*.

Loop With this Fibre Channel option, the port operates with attached loop-capable devices. If a point-to-point device is attached, the appliance is not able to communicate with it.

Loop ID A unique 7-bit value from 0 to 126 that represents the 127 valid AL_PAs (physical addresses) on a loop.

LTO (Linear Tape Open) A family of magnetic tape media that are "open" in the sense of not being owned by a single proprietor. LTO comes in two formats, Accelis and Ultrium. Accelis is the fast access implementation, while Ultrium is the high capacity implementation.

LUN (Logical Unit Number) A unique identifier used on a SCSI bus to distinguish between devices that share the same bus. A LUN can be an end user, a file, or an application. In storage technology, a single large storage device might be divided into smaller pieces, either to make the vast storage space more manageable or because the storage space is dedicated to different servers, drives, or applications. When the storage space is divided into smaller parts, each part is configured with its own SCSI unique identifier, or LUN.

M

Magazine A container for removable media storage used in tape libraries.

Media A material that stores data, such as tapes in cartridges or optical disks.

Media ID A barcode number attached to a specific piece of media.

Media type A format/size of media, for example, LTO.

Medium See *Media*.

Mixed media The ability of a library to simultaneously support multiple types of storage media.

N

N_Port Node Port. It only has the capability to communicate through an F-Port. It is a port on a computer, disk drive, and so on, through which the device does its Fibre Channel communication as a direct fabric-attached port for use with the point-to-point or fabric topology. It is identified by a world wide name.

NL_Port Node Loop Port. It has the capability to communicate over both FC-AL hubs and through F_Ports.

O

Online A status for a component that indicates it is active and available for use.

OS (Operating System) A control program for a computer that allocates computer resources, schedules tasks, and provides the user with a way to access the resources.

P

Partition An abstraction of an underlying physical library that may present a different personality, capacity, or both to a host. It is a representation of real physical elements, combined to create a grouping that is different from the physical library. Also a logical portion of the physical library that is viewed by the host as if it is a complete library. Partitions present the appearance of multiple, separate libraries for purposes of file management, access by multiple users, or dedication to one or more host application.

Pathname A list of directories separated by slashes (/) and ending with the name of a directory or nondirectory file. A pathname is used to trace a path through the file structure to locate or identify a file.

Picker The robotic hand that handles cartridges.

Point to Point A Fibre Channel topology that consists of a dedicated connection between two devices: a sending device and a receiving device.

R

Rack Mount An industry standard communication and computer equipment rack cabinet.

S

SAN (Storage Area Network) A dedicated network that connects storage devices and servers in a pool, providing consolidated storage and storage management. Storage interconnects between many initiators and target devices. The SAN allows for sharing resources (target devices) among multiple servers (initiators).

SCSI (Small Computer System Interface) A set of standards for a high-speed, parallel interface that connects processing devices

to peripheral devices, such as storage subsystems. The acronym is pronounced "scuzzy."

Server A powerful, centralized computer (or program) designed to provide information to clients (smaller computers or programs) upon request.

Setup wizard A tool for initially configuring the library. It appears the first time the user starts the library. However, it can be used to modify configurable items anytime after the initial configuration.

Sled The hardware that houses tape drives in the library.

SMI-S (Storage Management Initiative Specification) An industry standard SMI-S application programming interface (API) developed by SNIA that facilitates the management of multi-vendor devices in a storage area networks (SANs) environment.

Snapshot A rapid, point-in-time image of a volume created initially on the same disk as the original by duplicating metadata rather than copying the full data set. Snapshots are often used to protect against data corruption (viruses, etc.) or to create test or pre-production environments. Snapshots are also often used as a first step for creating non-disruptive point-in-time backups, and for copying datasets to a second disk to create a full duplicate copy of the volume. Snapshots are created on disk, and in the same format as the original data. Snapshots are also referred to as point-in-time copies and as shadow copies.

SNMP (Simple Network Management Protocol) The protocol governing network management and the monitoring of network devices and their functions. Similar in function to SAM, except SNMP governs LAN, whereas SAM governs SAN.

SSL (Secure Sockets Layer) A protocol that provides encrypted communications on the Internet. SSL is layered beneath application protocols such as HTTP, SMTP, Telnet, FTP, Gopher, and NNTP and is layered above the connection protocol TCP/IP.

Storage device An appliance containing data that can be accessed, added to, changed, or deleted by the user. The storage media types include tapes and optical disks. A storage device can be a single disk drive, or constitute thousands of tapes in a large tape library.

Storage slot The physical home where a data cartridge resides.

Subsystem status A feature that provides predictive alerts, warning of any loss of connectivity or device failure using local or remote alerts. Subsystem status allows administrators to correct faults before they affect backup or other data transfer operations.

T

Tape drive A device that spins disks and tapes while it reads and writes data in storage.

TCP/IP (Transmission Control Protocol/Internet Protocol) The communications protocol used by the Internet. It runs on top of Ethernet to provide high-level networking services to applications.

Topology The logical and/or physical arrangement of stations on a network.

Trap An SNMP alert that is sent when predefined conditions are met. For example, an error trap tests for an error condition and provides a recovery routine.

U

User ID An alphanumeric value that the password database associates with a login name. Also, UID.

UTC (Coordinated Universal Time) The world-wide standard for time, commonly considered to be the equivalent of "Greenwich Mean Time" and "Zulu time." For all of these time standards, zero (0) hours is midnight in Greenwich England, which lies on the zero longitudinal meridian. The sequence of the letters in the acronym is a compromise between the English and French terms (*Temps Universel Coordonné*).

W

WORM (Write Once, Read Many) A common type of data storage medium, in which data can be read and reread, but not altered, after it has been recorded.

WWNN (World Wide Node Name) A unique number assigned by a recognized naming authority. The world wide name is integral to Fibre Channel operations.

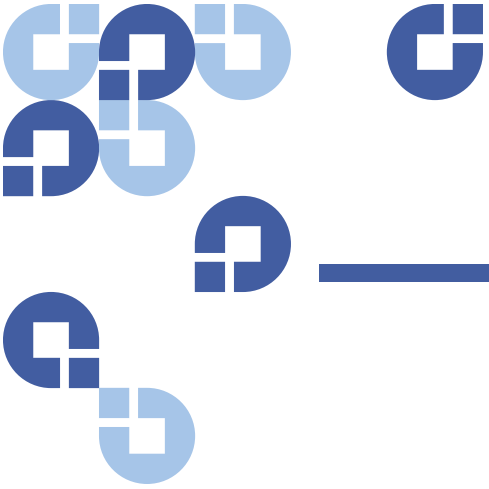
WWPN (World Wide Port Name) The WWPN is a 64-bit, hard-coded address for each port on an FC-connected device. It is used to identify available SAN devices at end points.

X

X-axis, X-position The horizontal position of the library's robotic arm.

Y

Y-axis, Y-position The vertical position of the library's robotic arm.



Index

A

About Library 140
advanced reporting 11, 152
all slots report 147
authentication traps 47
authorization code 68
AutoClean 130
autoleveling 164

B

back button, browser 31
barcode
  formats, media 56
  labels, installing 267
  requirements 265
  scanner 3
bezel, library, replacing 198
browser back button 31
browsers, supported 274
bulk loading cartridges 121
buttons
  back, browser 31
  navigation 3
  navigation/selection 30
  operator panel 30
  power 3

C

cabling the library 173
Capacity on Demand 11
capturing the library snapshot 247
cartridges, see tape cartridges 264
chassis,removing and replacing 202
cleaning cartridges
  exporting 133
  importing 131
  valid 130
cleaning log 148
cleaning slots, configuring 61
cleaning tape drives 128
  automatic 130
  manually 134
COD, see Capacity on Demand 11
community string 48
configuration
  default 42
  host software 26
  initial 19
  library 39
  restoring 101
  saving 101
contact information
  customer 77
  Quantum xxiv
control path 67
copyright 160
customer contact information 77

D

date, setting 50
daylight saving time, setting 51
default administrative account 79
default configuration 42
default gateway 45
default password 80, 104
default user name 80, 104
defaults, resetting factory 261

desktop kit
installing library in 189
removing library from 197
DHCP 43
diagnostic tickets
about 244
log 149
viewing, closing, and resolving 244, 245
diagnostics 259
resetting a tape drive 260
robotics get/put 261
disposal information 285
DNS addresses 45
downgrading library firmware 101
drive resource utilization report 154

E

e-mail account, library 74
e-mail notifications
about 71
creating 72
deleting 74
modifying 73
send snapshot 75
emergency power-off procedure 112
ESD precautions 172
exporting
cleaning cartridges 133
tape cartridges 123
external management applications 46

F

factory defaults, resetting 261
filler plate
power supply, removing and installing 214
tape drive, removing and installing 213
firmware 164
library, downgrading 101
library, upgrading 161
tape drive, upgrading 164
front panel 2

G

gateway 45
get/put test 261

H

health status icons 29
home page 33, 34
host name 43
host software configuration 26

I

I/E station slots, configuring 63
I/E station, unlocking 113
I/E station, unlocking more than one 113
ICMP 98
importing
cleaning cartridges 131
tape cartridges 117
tape cartridges, unassigned 118
installation and verification test 255
installation, initial 13
Internet browsers, supported 274
internet control message protocol 98
IP address
configuring 44
IPv4 44
IPv6 44
library 105
IVT 255

K

Kerberos 87, 90
Kerberos service keytab file 91

L

LDAP
accounts 86
configuring 88
server guidelines 87
LEDs 250
front panel 251
power supply 255
power-on 3
system control board 252
tape drive/sled 253
ticket indicator 3
library configuration
record 143
report 141
saving 101
library name 43
library not ready messages 248
licensable features 68
license key certificate 68
license keys
about 69
applying 70
chassis replacement and 69
obtaining 69
SCB replacement and 69

viewing 68
licenses
report 152
viewing 68
loading tape drives 125
local user accounts
about 78
creating 81
deleting 82
modifying 82
location coordinates
slot 4
tape drive 8
logged in user's report 146
logging in
first time 25, 104
Kerberos enabled 105
LDAP enabled 105
operator panel 104
simultaneous 104
Web client 105
logging out 32, 106
automatically 106
logical serial number addressing 94
logs
cleaning 148
diagnostic tickets 149
tape drive 149, 250

M

magazines
description 4
releasing 114
removing and replacing 215
test 257
manual cartridge assignment 95
mask, subnet 45
media barcode formats 56
media integrity analysis report 156
menu trees 36
MIB, SNMP 48
Microsoft Active Directory 87
move test 258
moving tape cartridges 121
moving the library 237

N

navigation buttons 3
network interface 97
network prefix 45
network settings
changing 42
configuring 42
report 145, 151
network time protocol 50
NTP 50

O

online/offline
library 113
partitions 59
tape drives 137
open source license agreement 159
operator panel
buttons 30
description 2
functions 28
layout 28
passwords 83

P

packaging the library 237
partitions
about 52
access 59
automatic creation 53
deleting 57
description 10
manual creation 55
modifying 57
reports 151
taking online/offline 59
viewing 58
passwords, operator panel
creating 83
disabling 85
misplaced 86
modifying 85
resetting 86
passwords, Web client
creating 81
default 80, 104
misplaced 104
modifying 82
popup blockers 31
power button 3
power supply
description 7
removing and installing 220
power-off, emergency 112
power-on LED 3
privilege levels 80

R

rack
installing library in 186
removing library from 188
rack mount kit, installing 174
rail kit, see rack mount kit 174
random move test 258
registering the library 102
releasing magazines 114
remote access, enabling/disabling 98
remote authentication 86
remote service login 99

removing power 107, 111
reports
about 140
advanced reporting 152
all slots 147
date/time 152
drive resource utilization 154
library configuration 141
licenses 152
logged in users 146
media integrity analysis 156
network settings 145, 151
operator panel 151
partition 151
system information 140
resetting factory defaults 261
resetting tape drive 260
restart 107, 109
restoring the library configuration 101
robot 3
get/put test 261
releasing 16
replacing 242
robotics test 257

S

saving the library configuration 101
scanner,barcode 3
SCB, see system control board 7
secure socket layer, enabling/disabling 99
security settings 97
service port 77
session timeout 93
setup wizard 19, 41
shipping the library 237
shut down 107
slots, location coordinates 4
SMI-S, enabling/disabling 96
snapshot, capturing 247
SNMP
authentication traps 47
community string 48
configuring 45
enabling/disabling 96
MIB, downloading 48
versions 47
specifications 269
SSH services, enabling/disabling 97
SSL, enabling/disabling 99
subnet mask 45
subsystem status 35
system control board
description 7
removing and replacing 223
system information report 140
system settings 93
system summary 34

T

tape cartridges
bulk loading 121
exporting 123
importing 117
map, creating 216
moving 121
proper handling 264
unassigned 118
write protecting 265
tape drives 164
cleaning, about 128
cleaning, automatically 130
cleaning, manual 134
description 8
loading 125
location coordinates 8
log 149
online/offline 137
paramaters, configuring 65
removing and replacing 231
resetting 260
test 257
unloading 127
Tape Alerts 275
TCP 46
tests
installation and verification (IVT) 255
magazine 257
random move 258
robotics 257
robotics get/put 261
tape drive 257
ticket indicator LED 3
time zone, setting 51
time, setting 50
timeout 93
traps 47
troubleshooting 243
turning off 107, 111

U

UDP 46
unassigned tape cartridges, importing 118
unload assist 94
unloading tape drives 127
unlocking the I/E station 113
unpacking, library 14
upgrading library firmware 161
upgrading tape drive firmware 164
user name, default 80, 104

W

Web client
description 31
display 34
home page 33, 34

WORM 11
write protecting cartridges 265